Open Data for Development (OD4D) Node

Middle East and North Africa (MENA)

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Open Data for Development
Middle East North Africa Node

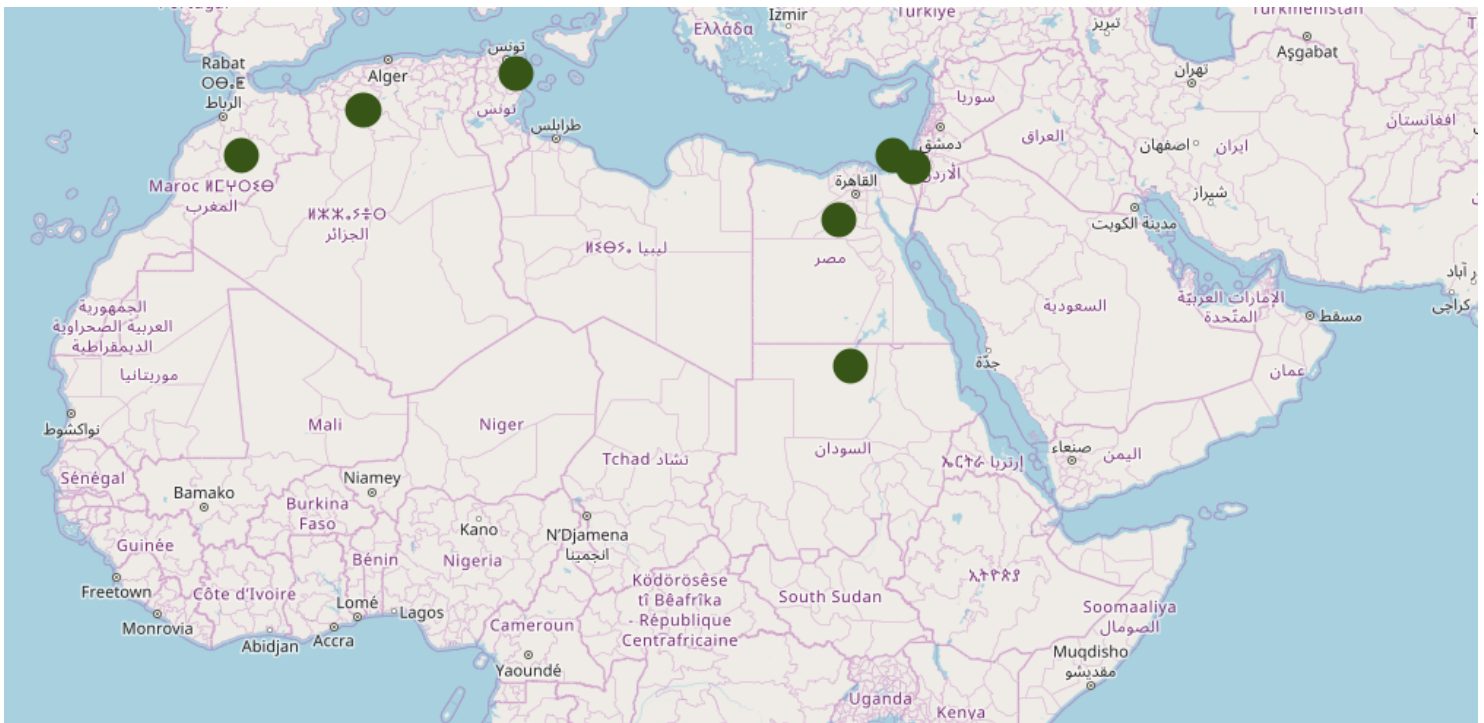**Active countries:** Algeria, Egypt, Jordan, Lebanon, Morocco, Palestine, Tunisia

Figure 1: Screenshot of MENA Region from © OpenStreetMap contributors

Figure 2: OD4D MENA Node's Network

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1. SYNTHESIS

The **Open Data for Development (OD4D) program** is a global network, bringing together local partners, to advance the production, management, and use of open data in the field of development. The program looks to scale innovation, strengthen initiatives, and facilitate coordination between different actors and projects working in open data. The OD4D network was created in partnership between Global Affairs Canada, The World Bank, the United Kingdom's Department for International Development (DFID) (through the INASSA program), and the International Development Research Centre (IDRC) and supports several nodes around the world.

The Middle East and North Africa (ODMENA) node functions as a coordinating body, providing support and impetus for the data ecosystem at large: first, by bringing focus to goals and aligning efforts to common challenges; and, second, by highlighting the critical role of various different actors across the region working in unison. The node brings resources and knowledge from the region to the global Open Data scene, building stronger connections with international open data initiatives and partners.

In an effort to streamline activities and initiatives, the node has placed emphasis on the role of open data in achieving the Sustainable Development Goals in the MENA region. From these goals, four themes emerged. These allow for the most impact in achieving common goals towards cross-project collaboration. The themes which are outlined in further detail in the following section: THE RESEARCH PROBLEM, are summarized as: **Data Skills, Urban Development, Gender, and Policy.** Themes and activities are illustrated in Figure 3 below.

A focus on gender mainstreaming across the node has been at the heart of the activities undertaken during the project. Having identified the lack of gender disaggregated open data, gender equality in open data decision making positions, and in the field of data science as main challenges, the node focused on gender inclusivity as way forward. In order to facilitate this effort, the node utilized the expertise of a gender consultant to evaluate activities and provide an assessment with recommended ways forward at the end of the first year. The assessment is included in Annex 1 of this report.

ODMENA carried out activities in Algeria, Egypt, Lebanon, Morocco, Tunisia, and Palestine, with research extending to other areas of the region. Over the past two years, the node has contributed to an emerging data ecosystem in the region through working with partners to build evidence of, and strengthen, open data creation and use. Working towards building the supply of quality open data, node activities aimed to advance the creation/development of a locally-driven and sustainable open data ecosystem in the region.
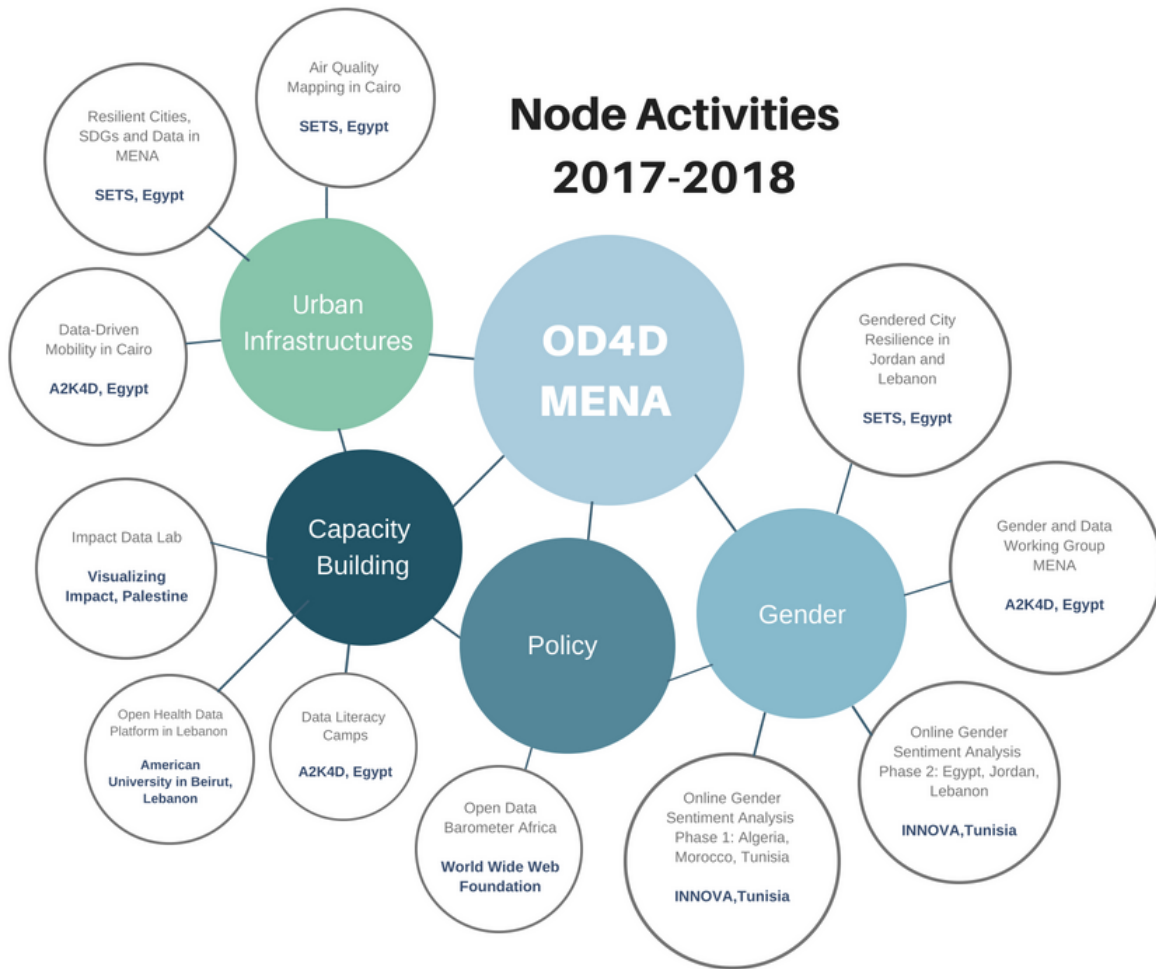
Figure 3: OD4D MENA Node Core Themes and Activities

2. THE RESEARCH PROBLEM

The project has focused on specific objectives: leading open data agenda setting, streamlining regional efforts, building skills and capacities, and effecting sustainable impact across the region. These served as a framework for constructing research problems within individual activities and initiatives. Projects therefore evolved in the last period to ensure these strategic objectives are being met, and outcomes would create impact within this framework. Central objectives are illustrated in Figure 4. The sections below outline the thematic objectives and their potential impact, and briefly describe the activities and initiatives included under each cluster. Most projects fit within two or more themes.

OBJECTIVES

AGENDA SETTING
Lead in agenda setting and identifying gaps where data is under-utilized.

COMMUNITY BUILDING
Build capacities across stakeholders and share resources and best practices in the region.

LOCALIZE EFFORTS
Create knowledge and expertise that is local and relevant to the MENA region.

ENCOURAGE DATA STANDARDS
Encourage better data standards for collection, management and use.

OFFER POLICY ADVICE
Assess and offer advise on policy frameworks for the region.

Figure 4: OD4D MENA Core Objectives

2.1. DATA SKILLS

Data-related skills are of utmost importance in fostering an enabling environment for data in the region. These skills range from data visualization and journalism skills, to data science and management, and critically, skills that pertain to data used in development. Capacity should be built at different levels for various stakeholders. The following projects engaged in capacity building activities to build data skills.

Impact Data Lab	**Data Literacy Camps**
In March 2018, a workshop on mobilizing data and storytelling for social impact was held in Jordan. This was a joint pilot project between Visualizing Impact and various Palestinian civil society partners working in data journalism and visualization, with the aim of harnessing data for change.	ODMENA supported the participation of eight women in a data literacy camp held by the Arab Digital Expression Foundation (ADEF), targeting youth from Egypt and the MENA region. The data camp took place in September 2018, with sessions designed to cover themes related to data science, data analysis and extraction, data visualization and digital security tools.

2.2. POLICY

Another crucial element of an enabling environment around open data is creating local and contextual policy advice, reflecting on-the-ground experiences. The following projects focused on creating data-driven policy advice, addressing developmental challenges in the region.

Developing data-driven innovation for policymakers, stakeholders, and researchers	**Igniting the OD4D Maghreb**
A project led by the Knowledge to Policy Center at the American University in Beirut to a create an online platform *Health SystemEye* that disseminates health data and information about Syrian refugees in Lebanon to policymakers. This allows policy makers to make data-driven and needs based decisions. The main focus of Health SystemEye is cancer; therefore, all of the visualisations, information, and research content are based on cancer statistics and information in Lebanon.	A multi-stakeholder network for scaling collaborative and sustainable initiatives for open data for development. Innova Tunisia analyzed how the media portrays gender and gender first in Algeria, Morocco, and Tunisia, then in Egypt, Jordan, and Lebanon. Using natural language processing and artificial intelligence, sentiment analysis of digital content and media coverage was carried out in order to create a benchmark for tone coverage, how public opinion is framed, and what the agenda looks like for each respective country.

2.3. URBAN INFRASTRUCTURES

A priority for the region is development in both urban contexts. This includes a focus on healthy, resilient cities that are inclusive and empower the citizens that traverse them. The three initiatives outlined below have used data to assess urban mobility, city resilience, and air quality in the MENA Region.

Understanding City Resilience within MENA in Relation to SDGs and Availability of Data	Data Driven Mobility in Cairo
Resilience is an important feature of cities that allows them to absorb shocks to their social, economic, and technical systems and infrastructures with minimal damage. This initiative analyzed the resiliency challenges facing the 100 resilient cities (Rockefeller Foundation) in order to determine the different challenges faced by cities with different HDI rankings. Specifically, comparative analyses between Beirut and Amman will be drawn up, offering a glimpse of resiliency levels in the region.	The node identified regional gaps where open data is underutilized, and proposed solutions to circumvent challenges. This research component contributed new findings and insights to the field of transportation and urban mobility. It includes two main topics: Innovative methodologies for transitioning from knowledge to policy and Informal practices in developing economies as channels for sustainable development.
Agriculture and Gender in Sudan	Developing Air Quality Heat Map for Cairo: A Citizen-Centric Sensing Approach
An initiative was initially planned in the field of data and agriculture in North Sudan. It focused on analyzing the status of data and its levels of accessibility within the agricultural sector in Sudan. During the course of the project, the team reached out to several organizations and consultants working in Sudan, but there were no favorable responses. Resources were therefore used to further the activities under the gender theme.	The project focused on mapping Black Carbon concentrations throughout the city of Cairo. The project developed a Land-Use Regression Model that determined the pollution level of any area in Cairo based on the composition of that area. The tool can be of use to entities such as government planners, NGOs, and international donors.

2.4. GENDER

Finally, a critical priority for the node itself was gender inclusivity and initiating open data activities and research on gender. For this reason, the node created a region-wide research group to create a discussion on gender and data in the region and produce contextualized and localized research on the topic. Additionally, the node worked closely to utilize the gender consultant to provide feedback and guidance across projects.

• **Gender and Data Research Working Group** The aim of the gender and open data research group was to create context-based research on gender and data, encourage MENA gender data experts and expertise, and create guidelines for data and gender projects and initiatives. Through the initiation of the working group, a number of activities and outputs were developed including: three webinars discussing data and gender as they relate to research methodologies and project implementations, a number of gender thought pieces on open data in urban space, a working paper on early marriage in Egypt, and a briefing report reflecting on the experience of having a regional gender working group.	• **Understanding Gendered City Resilience in Jordan and Lebanon** Building on a previous project carried out by the SETS North Africa team, this project explored resilience tools and approaches, with a focus on city resilience to the refugee influx in Lebanon and Jordan. The project looked to incorporate a gendered perspective in order to explore the different experiences of men and women affected by the crisis, and the different tools they use to overcome the deeply rooted gender ideologies and unequal gender power dynamics. A specific focus was placed on the role of digital technologies in building resiliency strategies.

3. RESEARCH FINDINGS

The following section outlines the main objectives and research findings from projects under each node theme. This includes when relevant, research and planning that guided project design and development.

3.1. DATA SKILLS

3.1.1. Impact Data Lab

Visualizing Impact (VI) organized and held their Impact Data Lab (IDL) program in Amman and Ramallah from the 11th to the 17th of March, 2018. IDL set out to act as a space that brought together civil society groups with open data and explored how data journalism skillsets can strengthen existing data-driven human rights initiatives or foster new innovative skills. The general objective of the program was to strengthen the application of data journalism and data visualization practices, with a particular focus placed on those of significance to Palestinian communities. Three themes guided the content of the IDL: gender, education, and digital rights in the West Bank and East Jerusalem.

The themes were selected based on the following criteria:

- Relevance to development: the themes chosen were of interest to development stakeholders.
- Availability of data: the topics selected had to have a variety of data and information available from multiple sources.
- Interest within the OD4D network: the selection process considered the broader work and priorities of the OD4D node.
- Interest from partners and experts: themes were chosen that would elicit strong interest from impactful local partners and experts, in order to ensure the team built on existing areas of strong partnership.

Research into the different mediums of information dissemination revealed that traditional means of spreading knowledge are not enough alone to ensure an impact on the public. The team at VI found that training workshops and the development of material in different formats receives greater public reach and they allowed that knowledge to guide the program.

The 2018 program consisted of a set of core activities: 1) data exploration and preparation sessions, 2) introductory data journalism trainings, and 3) a hands-on prototyping workshop in which teams delivered prototypes responding to data on the three themes of gender, education, and digital rights in the Palestinian context. The team at VI was able to secure a partnership with Columbia University's Studio-X Amman, a regional platform with extensive experience on data-driven projects in the MENA region. VI also engaged with partners from a broad range of disciplines that added unique perspectives and value to the core themes. Participants invited fell into the following categories:

- Members of civil society organizations with an interest in data journalism
- Subject matter experts, specifically academics and researchers
- Community activists
- Practitioners of civic design and civic tech such as data journalists, designers, and web developers

Through the implementation of this program, the team set out to explore practices, standards, and mediums of dissemination that make data useful. The IDL's core activities were successfully carried out, the outcomes of which will be discussed in further detail in the following sections of this report.

3.1.2. Data Literacy Camp

Shared and equal access to digital tools continues to be a challenge in most countries in the MENA region. Access to data literacy skills across disciplines, is particularly less prevalent. This is especially true for more vulnerable socio-economic groups, as well as for women across different age brackets. The need for enhancing access to digital knowledge is powerfully iterated by the impetus of the open data movement yet requires localized efforts to capitalize on existing resources and in sourcing new ones.

Figure 5: Camp Participants

The data literacy camp was designed to meet this exact objective. Designed as an intensive summer camp for youth, the camp covered the themes of data literacy, digital security, data extraction, data analysis, and visualizations. The camp syllabus and program were designed by the [Arab Digital Expression Foundation](#) (ADEF), as they related to the above-mentioned themes. ODMENA supported the participation of eight women from the Arab region for the duration of the camp. The objective of this support was to contribute to the creation and maintenance of spaces that encourage and enable women to access different forms of digital knowledge.

Figure 6: Group Discussion

Another objective of the camp was to contribute to the discussion on gendered approaches to data, by documenting and disseminating the experience with the data literacy camp. Participants were asked to submit short blog posts. The pieces eluded to best practices in designing digital education modules for non-experts in the region, particularly those that consider gender in their design and implementation. The pieces will be used as material for developing education modules in the future, particularly as they pertain to growing digital knowledge and data skills.

3.2. POLICY

3.2.1. Developing Data-Driven Innovation for Policymakers, Stakeholders, and Researchers

In response to the needs of policymakers and decision makers, academics and researchers, and practitioners and stakeholders, K2P developed "Health SystemEye" - a platform that will serve as a data hub housing health data that will be relevant to and will help inform evidence-based decision making. The main form of data dissemination is visualizations, developed within the framework of the Health System Building Blocks. An accessible data registry and indicators for health data were identified, and these data sources will continuously be integrated into the platform.

The aim of the project is impact, with the platform being designed, piloted, and implemented to ensure the aim is fulfilled. The team at K2P set a 5-step process for the development of the platform. The first step involved a review of the various data systems and lists of indicators relevant to the topic. The second step involved a prioritization of the stakeholders and identification of the most important - and most relevant - indicators in Lebanon. These indicators focus on the various cancers, while the focus is on the Syrian refugee population, but also the Lebanese population at large, as there is no differentiation in the dataset in terms of nationality yet. The project's third step involved a selection of a sample of indicators based on prioritization and topic, as well of availability of data, in order to pilot the platform. All of the data present on the platform is from the Lebanese Ministry of Public Health (MOPH) and the National Cancer Registry found there. The fourth step involved an integration of the identified indicators on the platform, as well as evaluation and modification of the platform accordingly. The fifth and final step was the launch of the finalized platform with all the most relevant indicators. In addition to visualizing the data into both graphs and infographics, there are another two significant parts of the platform. The first is a comprehensive and regularly updated database of all the scientific research published on cancer in international journals and other recognized scientific avenues. The second part, which is more geared towards the average person, is another comprehensive database of all the news articles and general dialogue and debate on cancer in Lebanon.

Figure 7 below indicates the centrality of the people – which is at the heart of K2P's ethos of providing data for the sake of better policies, and ultimately, to benefit societies. The intersecting Venn diagram below highlights how different perspectives and disciplines are essential for the whole system to be efficient; for example, information without people and without governance loses its value; similarly, medicines, technologies, and information would not be realized without financing, and so on. Ultimately, the driving force behind K2P's Health SystemEye is not only the centrality of the people but the emphasis on collaboration.

Figure 7: Health System Building Blocks

3.2.2. Igniting the OD4D Maghreb

Phase One: Morocco, Tunisia, Algeria

Two main activities were supported during the previous reporting period (December 2017 – June 2018): the second and final draft of the *Gender Equality and Related Debates as Portrayed by Media in the Maghreb Region* and a supporting policy brief to disseminate findings. These outputs were based on a meeting with civil society held earlier in the project. This was a crucial step in creating a communication strategy with active stakeholders. The workshop was held on the occasion of the International Day of Democracy and was entitled 'For a more Open and Inclusive Democracy'. It drew participants from members of the private sector, representatives of the state and civil society. The report and policy brief are described below:

1. *Gender Equality and Related Debates as Portrayed by Media in the Maghreb Region*

This report explored the portrayal of gender in media debates related to women in three countries: Algeria, Morocco, and Tunisia. This was achieved by analyzing tone coverage and asking: who frames public opinion and who is driving the news agenda. The Innova team utilized a digital tool, WebRadar, to scan a sample of 22,200 media content items publicly available on the internet. This included pieces from news websites and social media. Natural language processing and artificial intelligence techniques developed by the team were used to structure and organize the content.

Key findings are illustrated in Figure 8. Sentiment from news material was mostly negative in Morocco and Algeria, and neutral in Tunisia. Sentiment from Facebook was mostly negative in Algeria, but neutral in Morocco

and Tunisia. The report also emphasized that all stakeholders (government, policymakers civil society, opinion leaders and international organizations) seem to see importance in gender equity. Media from governments' officials and politicians consistently emphasize women's the role in politics. Some opposition politicians in the three countries were an exception to this.
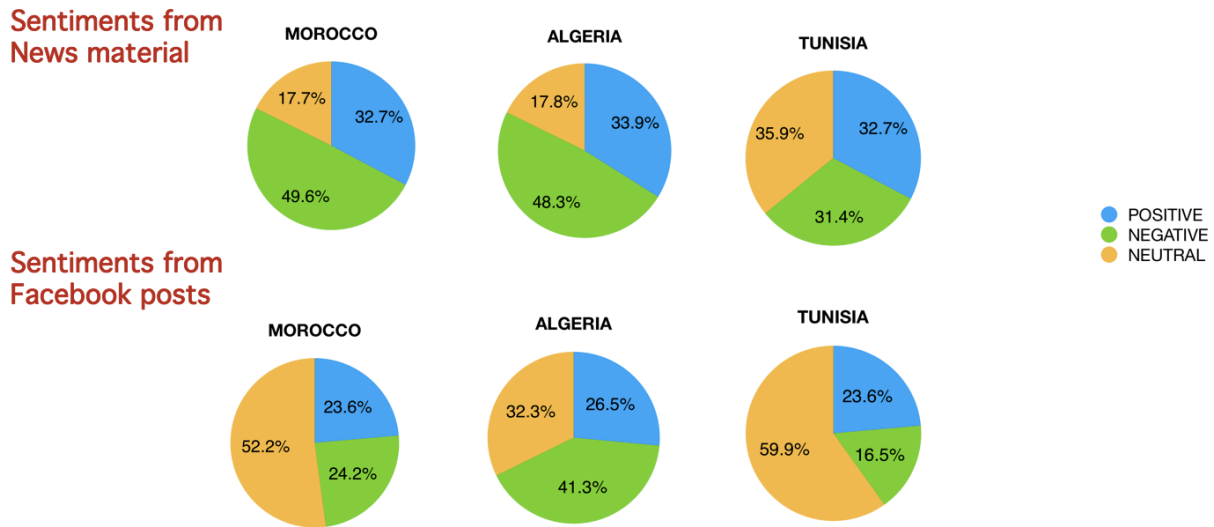

Figure 8: Gender Sentiment in news media and Facebook posts compared

The report concludes by noting that media related to gender equality are still lacking in both Algeria and Morocco, less so in Tunisia where more content is available. Authors emphasize that gender is not a 'hot' topic in public opinion, with small circles of people involved in discussions.

2. *The Policy Brief*

The policy brief accompanying the report contextualizes gender debates in the Maghreb region and offers specific policy advice. One finding in Algeria and Morocco points to the fact that almost all policy announcements took place on International Women's day, showing a lack of consistent focus on gender issues. Authors also suggest that the timing is also indicative of real will to make substantial change. As policy advice, authors suggest three points of action:

1. Identifying inconsistencies in reform policies in the field in order to deliver credible and life changing solutions.
2. Support local institutional initiatives to propose realistic and credible alternative solutions whenever they may seem contradictory with the official policies.
3. Create more opportunities for women to be present in socioeconomic and political debates.

Phase Two: Egypt, Lebanon, Jordan

Following the successful implementation and promising results that emerged from the previous mapping of the open data sphere and political discourse surrounding gender, Innova Tunisia undertook a second phase focusing on Egypt, Lebanon, and Jordan. Through the collection and analysis of over 20,000 content items from the web, the WebRadar tool utilized during the first phase was replicated to methodologically examine and evaluate the dialogue surrounding gender and gender equality in the media, the online public sphere, and in political dialogue. In so doing, Innova aimed to establish a multi-stakeholder network that works towards strengthening innovative initiatives that help foster dialogue among citizens and governments, and raise awareness surrounding the pressing issue of gender inequality in the region.

This second phases resulted in two outputs: an analysis paper on gender equality and women-related debates as portrayed by the media in Egypt, Lebanon, and Jordan, and an accompanying policy brief. The main findings and arguments of both of these are outlined below:

1. *Analysis Paper: Gender Equality and Women Related Debates Portrayed by Media in the MENA Region*

This analysis paper explored the media coverage of gender and women in three countries: Egypt, Lebanon, and Jordan. The aim of the report was to analyze the tone of media coverage on gender (whether positive, negative, or neutral), identify the different actors that are active in shaping public opinion, and establish the prevalent arguments for and against gender equality. They were able to do so through the use of the WebRadar tool, which utilized natural language processing tools and artificial intelligence to search the web, structure content, and identify positive, negative, or neutral sentiment.

Their key findings are illustrated in the figure below, which represents sentiment from news coverage across the three countries (Fig. 9). Sentiment across the three countries appears to be neutral, with Jordan being the most neutral. As for positive sentiment, Jordan has the lowest rate of positive sentiment at 10%, as opposed to Egypt with 11% and Lebanon – the highest – with 35%. The highest rate of negative sentiment emerged from Egypt at 28%. It is worth noting that these rates are relative given the difference in size of the population, and therefore the amount of content being produced and consumed.
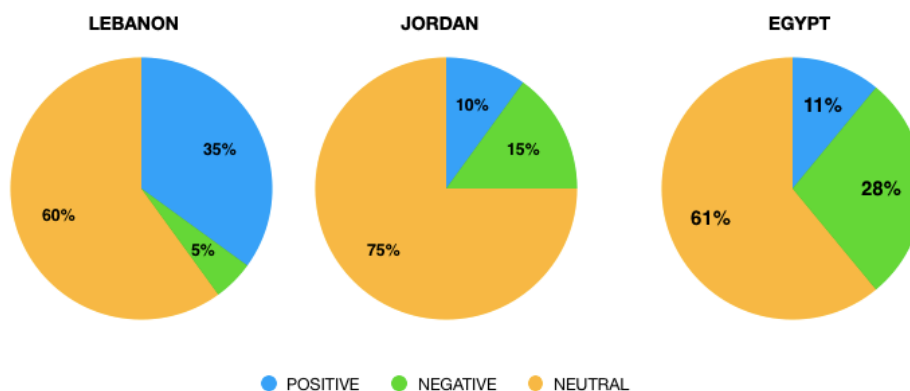

Figure 9: Media Coverage of Gender and Women

The report concluded that the topic of gender and gender equality appears to be gaining momentum in the region, but that it is still not a priority topic for these countries. The report recommends that further legislative and constitutional efforts need to be made in the three countries in order for positive change to be enacted.

2. *Policy Brief: Gender Equality and Women Related Debates Portrayed by Media in the MENA Region*

The policy brief accompanying the analysis paper aims to further contextualize the research on gender in Egypt, Lebanon, and Jordan, and offers policy advice and palliative local solutions to some of the challenges facing these three countries when it comes to the development and enactment of gender sensitive and responsive policies. Similar to the previous policy brief on the Maghreb region, Innova's research also found that both Jordan and Lebanon made almost all gender-related decisions and policy announcements on International Women's Day. Jordan, however, appeared to be making incremental steps towards protecting women's rights, mainly due to efforts from government and civil society organizations to ensure equal access to education for both men and women.

As advice for improving public policies in the three countries, the authors suggest:
1. The creation and reform of specialized public policies that are dedicated to women-related challenges and issues.
2. More effort from governments and civil society to ensure the full and equal participation of women in the decision-making processes.
3. Advocacy for better engagement and participation from both men and women in policy reform.

3.3. URBAN INFRASTRUCTURES

3.3.1. Developing Air Quality Heat Map in Cairo: A Citizen Centric Approach

The World Bank estimates that around 125,000 lives were lost in the MENA region in 2013 to air pollution related diseases. Since then, traffic has increased and pollution has worsened, making it necessary to address the problem through evidence-based solutions. The Air Quality Heat Map provided an inexpensive model for understanding air pollution distribution by harnessing the power of mobile technology and advances in collecting, managing, warehousing and visualizing data.

The project focused on mapping Black Carbon concentrations throughout the city of Cairo. Black Carbon, along with CO_2, is one of the major contributors to climate change, and is a product of incomplete combustion of fossil fuels. Factors that influence the spatial variability of Black Carbon include traffic patterns and land-use, and a better understanding of how these factors affect pollution levels is helpful in developing innovative policies and guidelines moving forward. The tools can be of use to entities such as government planners, NGOs, and international donors.

The project developed a Land-Use Regression Model that determined the pollution level of any area in Cairo based on the composition of that area. The model was used to determine the factors that have the largest impact on Black Carbon Concentration levels and it identified 21 explanatory variables to be of significant impact.

Explanatory Variables		Estimate	Std. Error	t value	Pr(>|t|)	
	(Intercept)	3.01E+00	6.34E-02	47.361	< 2e-16	***
Allowance of Heavy Trucks	Heavy Trucks Existence	2.17E-01	4.93E-02	4.401	1.15E-05	***
Distance to	Airport	-8.12E-06	3.20E-06	-2.535	0.011348	*
	Nile	-1.05E-05	2.97E-06	-3.537	0.000416	***
Population per Buffer	Population Density (buffer 100m)	2.70E-06	5.19E-07	5.198	2.29E-07	***
Traffic	AM Congestion Index (buffer 100)	1.41E-03	4.59E-04	3.074	0.00215	**
LU Area Per Buffer Area	Urban (Buffer 25m)	-5.00E-01	6.33E-02	-7.9	5.27E-15	***
	Informal (Buffer 25m)	-2.56E-01	9.17E-02	-2.785	0.005414	**
	Governmental (Buffer 25m)	7.66E-01	2.20E-01	3.484	0.000507	***
	Recreation Space (Buffer 25m)	-1.03E+00	2.36E-01	-4.357	1.40E-05	***
	Schools (Buffer 50m)	-1.65E+00	5.50E-01	-3.001	0.00273	**
	place of worship (Buffer 1000m)	4.33E+01	5.25E+00	8.249	3.38E-16	***
	Commercial (Buffer 50m)	-1.68E+00	6.62E-01	-2.531	0.011473	*
	Gas STN (Buffer 750m)	4.60E+01	1.58E+01	2.919	0.003565	**
	Monuments (Buffer 300m)	-1.63E+00	6.69E-01	-2.431	0.015181	*
Roads Length Per Buffer Area	Regional Primary Highway (Buffer 25m)	7.61E+00	1.28E+00	5.924	3.88E-09	***
	Primary Arterial (Buffer 25m)	2.90E+00	8.88E-01	3.262	0.001129	**
	Secondary Arterial (Buffer 25m)	4.74E+00	8.52E-01	5.567	3.05E-08	***
	Primary Collector (Buffer 500m)	-2.80E+01	8.10E+00	-3.459	0.000557	***
	Secondary Collector (Buffer 50m)	-1.28E+01	2.73E+00	-4.681	3.10E-06	***
	Local Roads (Buffer 1000m)	-1.77E+01	3.37E+00	-5.26	1.64E-07	***
Railway Length Per Buffer Area	Rail (Buffer 100m)	1.71E+01	4.04E+00	4.226	2.52E-05	***
Significance codes:	0-0.001 ***		0.001 - 0.01 '**'		0.01 -0.05 '*'	

Overall Model Statistics
R^2=0.3717 Adj R^2=0.3631
Residual standard error of 0.4952 on 1543 degrees of freedom

Figure 10: Significant Explanatory Variables Identified by Model

The heat map produced gave a visual representation of BC concentration throughout Cairo. From the map, it is easy to identify the areas with the highest pollution levels and this is extremely useful for policy decisions. It was found that:

- Average modeled BC concentration in Cairo is 14ug/m^3
- Average modeled BC concentration in Downtown Cairo is 16ug/m^3
- Ramses Square had the highest BC concentration levels in Cairo
- There was severe ambient BC concentration around Rail Stations (4 times the average) and areas with Government Use (1.5 times the average)
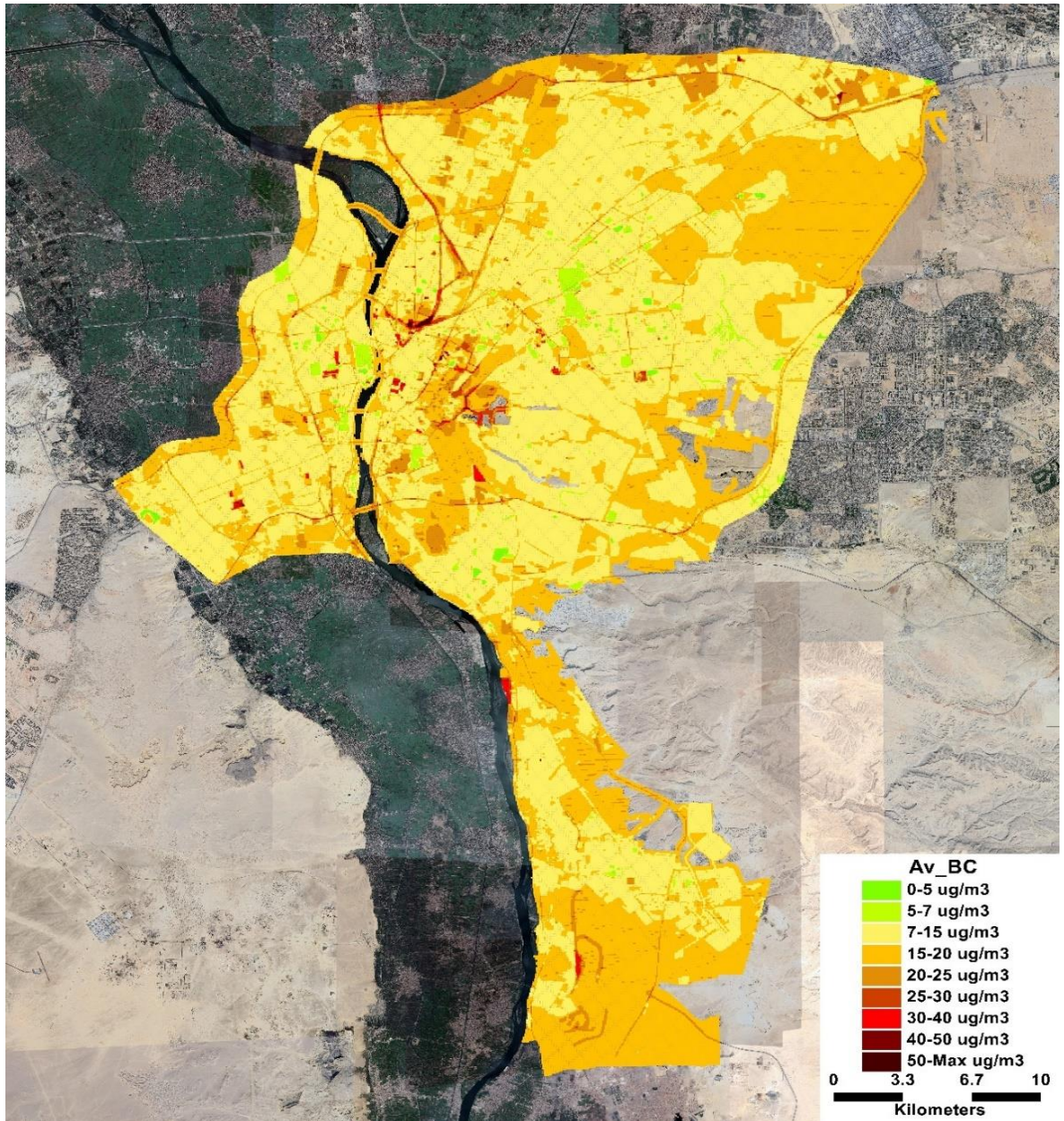
Figure 11: Heat Map of BC concentration in Cairo

3.3.2. Understanding City Resilience Within MENA in Relation to SDGs and Availability of Data

City resilience is an issue that has come into the spotlight as a result of the high urbanization trends observed all over the world. Resilience is an important feature of cities that allows them to absorb shocks to their social, economic, and technical systems and infrastructures with minimal damage. The study analyzed the resiliency challenges facing the Rockerfeller Foundation's 100 resilient cities in order to determine the different challenges faced by cities with different HDI rankings. This was done to determine which resiliency challenges are universal and which are related to the socioeconomic status of the city. The following are some of the key findings.

What are common resiliency challenges and responses adopted by Cities?

- Out of the 100 Resilient Cities selected by the Rockefeller Foundation, there are 44 cities representing developing Countries and their resiliency challenges.
- Common resiliency challenges between developing and developed countries include climate change, infrastructure failure, and pollution.
- Enhancing resilience requires a change of mind-set among citizens and all stakeholders.
- Renewable energy technologies and multiple stakeholders' collaboration are two of the most significant resiliency reinforcement strategies that cities of developing countries use

What is unique about MENA region Resiliency Challenges?

- Within the MENA region, there are four cities on the list of 100 resilient cities namely: Luxor, Byblos, Ramallah, and Amman. Being cities in developing countries, these cities generally face the same resiliency challenges faced by their peers.
- Political instability and the Syrian refugees' influx are common challenges in the MENA region
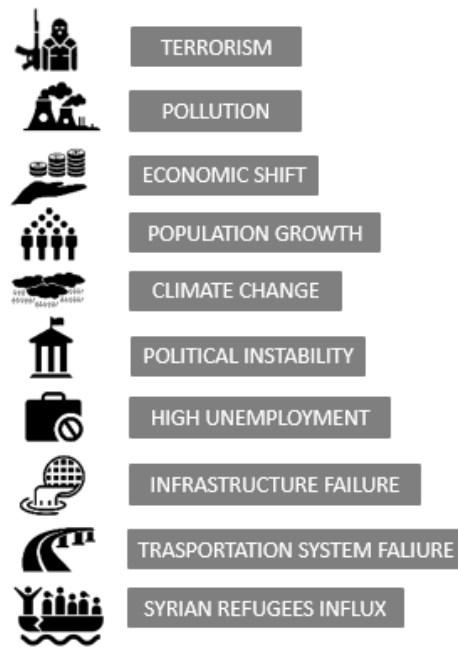

TERRORISM

POLLUTION

ECONOMIC SHIFT

POPULATION GROWTH

CLIMATE CHANGE

POLITICAL INSTABILITY

HIGH UNEMPLOYMENT

INFRASTRUCTURE FAILURE

TRASPORTATION SYSTEM FALIURE

SYRIAN REFUGEES INFLUX

Figure 12: Common stresses and shocks facing the MENA region

The study focused on the impact of the Syrian refugee crisis on two cities in the MENA region: Amman and Beirut. The crisis led to Syrian refugees accounting for 16 % and 25% of the populations of Jordan and Lebanon. This has caused a strain on both countries' resources and the impact on the resilience of Amman and Beirut was used to gain insight into the unique challenges that result from a strain on resources.

- 90% of the resiliency reinforcement strategies of both Amman and Beirut fall under the establishment of vulnerabilities protection systems

- Resiliency reinforcement strategies of Amman and Beirut tend to have a short to mid-term time frame of implementation to be able to respond to the urgency of the shock, provide basic human needs and minimize human vulnerability.

The study also presented a comprehensive understanding of city resilience frameworks including a detailed mapping of their indicators and an investigation of the relationship between city resilience and Sustainable Development Goals (SDGs) as well as other development indices, such as Prosperity Index, Sustainability Index, and Human Development Index. This was done through the development of a Resiliency Reinforcement Strategies Database (RRSD), an online data repository that includes planned initiatives or strategies that are designed to enhance one or more attributes of a city with the objective of making the city better able to cope with any of its resiliency challenges.

Will making cities more resilient help them achieve their Sustainable Development Goals (SDGs)?
- All 17 SDGs were either directly or indirectly related to at least one City Resiliency Indicator. The SDG that exhibited the greatest extent of overlap was *Goal 16. Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable, and inclusive institutions at all levels.*
- Enhancing city resilience directly or indirectly is proven to assist countries to achieve their Sustainable Development Goals.
- Viewing from the lens of city resilience, several strong touch points with SDGs were also notable:
  - Minimizing human vulnerability in cities touched upon multiple SDGs like ending hunger, provision of clean water and sanitation, providing affordable and clean energy, providing for sustainable cities/communities.
  - Effective provision of critical city services touched upon multiple SDGs like provision of clean water and sanitation, providing affordable and clean energy, and provision of infrastructure.

3.3.3. Data Driven Mobility in Cairo

In 2015, the United Nation's Sustainable Development Goals (SDGs) defined Target 11.2 as the goal to "provide access to safe, affordable, accessible and sustainable transport systems for all; improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities and older persons." Discussions surrounding the SDGs marked a growing recognition around the world of the integral role of data in both evidence-based planning and service-monitoring. In 2014, the Economic Commission for Latin America and the Caribbean – one of five regional committees of the United Nations – called on countries around the world to capitalize on this 'data revolution' by allowing data "to play its full role in the realization of sustainable development".

The research for this track has been premised on developing innovative data collection techniques in order to rigorously evaluate road conditions and, in doing so, be able to propose policy changes that would improve commuting in Cairo. The Cairo Ring Road was chosen as the focus of our work, as it is the most heavily commuted roadway in Greater Cairo, combining informal and formal modes of transport as well as pedestrians and drivers

alike. In order to explore and document the potential of data availability and accessibility for a multiplicity of stakeholders, this initiative directed its focus and objectives towards the following two thematic topics: First, the theme of informality in the transportation sector, considering the different opportunities that informal mobility activities can offer to integrated and sustainable urban mobility planning. The second, challenges and dynamics of transitioning from data to policy, particularly in developing countries where access to data is scant and where institutional structures often hinder the up-take of collected data towards meaningful policy recommendations.

For the objective of our study, the Ring Road was split up into 20 different segments (10 in each direction) in order to compare the characteristics and needs of the road across its different sections, shedding light on the needs and challenges facing each. The study used innovative data sources, such as data mining from Google Traffic as well as an image capturing software which allowed researchers to map out all informal characteristics of the Ring Road along its length. Additionally, the team utilized population statistics from Egypt's Central Agency for Public Mobilization and Statistics (CAPMAS) to calculate density of the areas surrounding the ring road.

One of the main contributions of the study was to understand the changing patterns of use and demand across the Cairo Ring Road. As shown in Figure 13 below, it was found that the Southwest corner of the Ring Road is bordered by one of the most densely populated areas in the whole of Cairo, with the section from 'Moneeb to Autostrad' having a population density over 70,000 people/km^2. This segment hosts a large number of informal mobility infrastructure and continues to require urgent action to relieve congestion and enhance accessibility for the road's different types of users. The Northern and Western segments were also found to be densely populated, as their surrounding areas were mainly informal in nature.
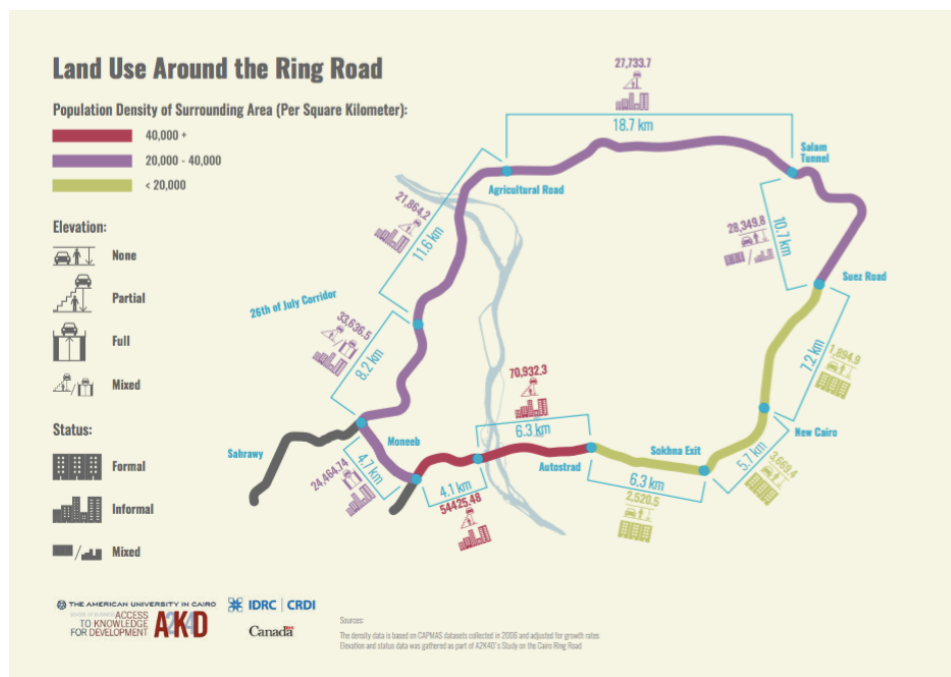

Figure 13: Land Use and Population Density Around the Cairo Ring Road

One of the other important findings of this study is its ability to shed light on the accessibility of the different segments of the Cairo Ring Road to different types of users. Accessibility infrastructure, both formal and informal, was mapped and counted on each segment of the road, allowing for a direct comparison of the segments. Figure 14 below shows the different forms of accessibility infrastructure present across the Ring Road and their relative concentration along different segments of the Ring Road.
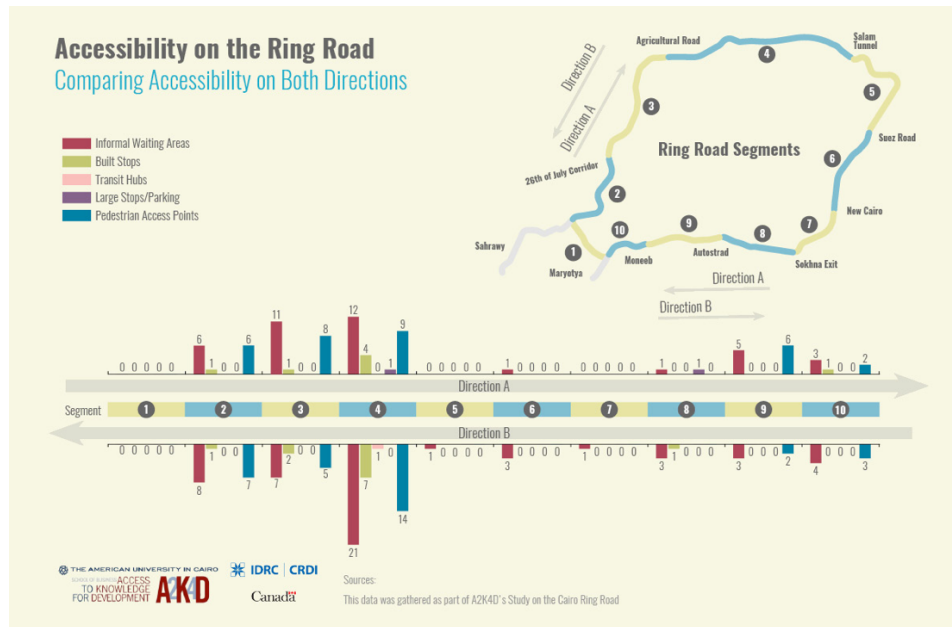

Figure 14: Accessibility Infrastructure on the Ring Road

The results showed that there is a severe lack of formal infrastructure such as built hubs and large stops along the entire road. This is often compensated for by informal infrastructure, such as pedestrian access points in the form of built staircases that give direct access to the road. These were found to be most common in high density, informal areas such as the area surrounding the segment from 'Salam Tunnel to Agricultural Road', as seen in the infographic above.

Safety conditions on the different segments of the ring road were also evaluated by comparing the number of accidents on each segment. As seen in the infographic below, the segment from 'Sokhna Exit to Autostrad' had the highest number of reported accidents per kilometer, closely followed by the segment from 'Moneeb to Maryotya Connection'. Interestingly, both of these segments have a low number of informal waiting areas and informal pedestrian access points, which slow down traffic and in turn, lower the rates of car accidents on the segments. Rather than compromising safety, informality has a more layered impact on Cairo's largest urban highway. That is, some informal infrastructure has actually led to decreasing the rate of speeding car accidents on the road thus improving its safety in some places.
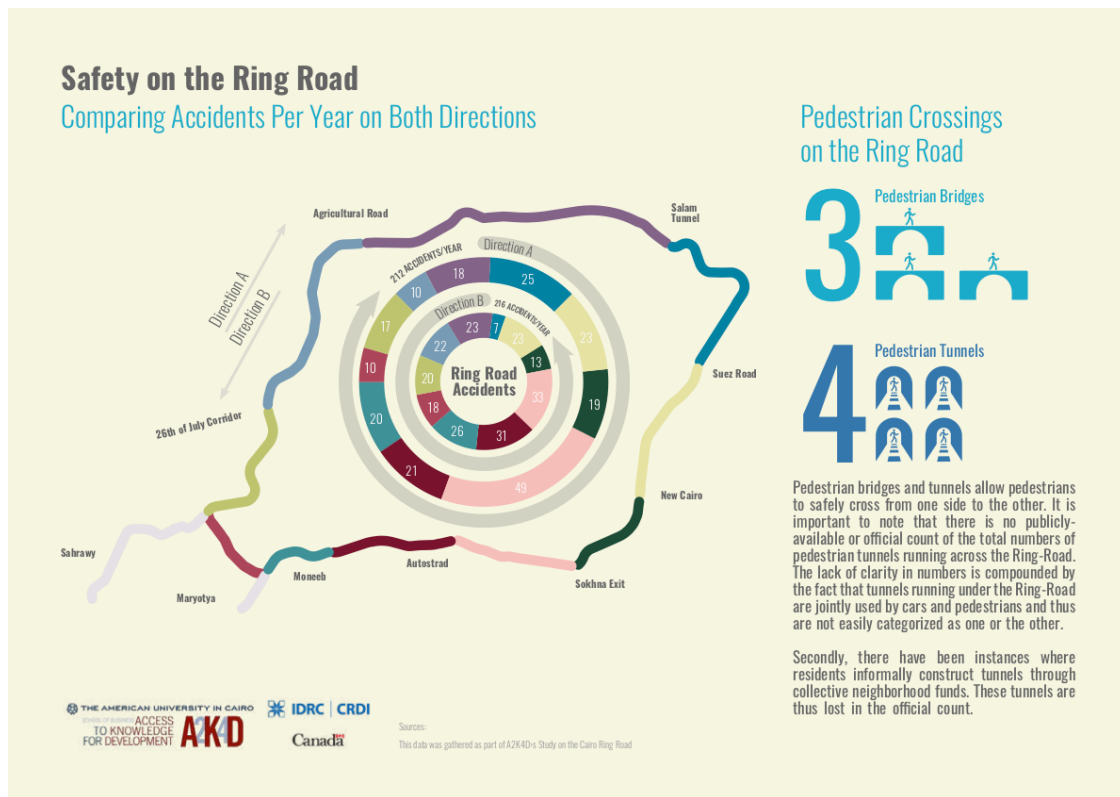
Figure 15: No. of Accidents on Each Segment of the Ring Road

3.4. GENDER

3.4.1. A Gender and Data Research Group in MENA

Preliminary research by the node found that gendered inequalities remain a pressing issue on both a local and global level, and that data plays an integral part in addressing and understanding systems of social inequalities. With this in mind, the Gender and Data Research Group was created in response to a need for accurate and sound data on gender in the region. Led by ODMENA, the group aimed to focus on preliminary angles through which data and gender can be approached and incorporated into data projects – namely by looking at the entire data lifecycle. Through the working group, a space was created where literature, expertise, and a working network came together in order to begin addressing some of the most pressing gendered issues in the region.

The specific objectives of the research group included:

- To create a space whereby issues relating to gender and data can be openly discussed
- To encourage MENA gender data experts and expertise
- To create guidelines for data and gender projects and initiatives
- To create context-based research on gender data

These objectives guided the workings of the gender working group and all related outputs, resulting in the creation and development of deliverables that aimed to highlight the importance of producing, collecting,

managing, and using gendered data that is timely, accurate, and representative of men and women's lived realities. Underpinning most of the research activities carried out within the working group was the awareness that open data allows for access beyond networks of connections that marginalized groups are often not privy to, allowing them for that data to be used to different ends as initiatives become more inclusive.

As part of the larger OD4D network – and in line with the node's vision and objectives – the ODMENA made a concerted effort to mainstreaming gender into all project outputs and activities. In order to help ensure that gender was being taken into account to the best of each project's abilities where possible, the node took on the professional guidance and expertise of Dr. Reem Wael, a gender consultant. Through her support and advice, the working group was able to map out and reflect on the potential ways through which gender can be incorporated into activities, as well as the ways in which individual research projects can be more gender sensitive and responsive. The node's outputs and their main findings include the following.

- **Gender and Data Seminars**:

    These online seminars – also known as webinars – brought together a community of data and gender experts and enthusiasts to discuss issues and challenges facing the field of gendered research and development. The webinars – which were prepared and moderated by Dr. Reem Wael – discussed a wide range of topics ranging from basic understandings of gender as it relates to research methodologies, to more complex questions on the use of gendered data by policymakers, and whether open data as we know it today plays an effective role in helping close the gender gap in research. Some of the main findings to come out of these webinars are included below. An overview of each of the webinars and their main objectives can be found in Annex 2.
    a) Men and women's experiences are unique and should be treated as such, they should not be measured against one another
    b) Education and awareness raising play a huge role in ensuring that a distinction is made between "gender" and "women's issues" as there is a misconception that gender refers only to women
    c) Digital tools can play a huge role in helping overcome some of the barriers associated with collecting gendered research such as concerns over privacy and the sociopolitical environment
    d) We need to be mindful of the limitations of open data, bearing in mind that women are less likely than men to have access to the type of resources that would be required for them to be able to engage with or benefit from research and data being made open. A report summarizing the main points and discussions of each webinar was prepared by Reem.

- **Short Pieces: Speculative Data Futures:**

    As part of the efforts to work towards creating context-based research and literature on gender data, the node also sent out calls for proposals for participants from within the research group and from the field to contribute to a collection of Speculative Data Futures pieces. The Speculative Data Futures pieces

brought together a collection of academic, fictitious, and introspective pieces that critically engaged with the topic of open data and gender. The medium of fiction was utilized as a means to explore what different trajectories, scenarios, and possibilities in the area of open data might look like. With a focus on the MENA region, the collection aims to bring valuable insights to the impact that open data can have on women's lived experiences in today's cities. The potentialities for mobility, participation, and innovation in urban spaces will arguably be reshaped by the growing momentum of the (open) data movement and this kind of transformative phase warrants an engaged discussion on the interplay between open data and gendered experiences.

Despite the powerful impetus of the movement in a growing number of countries, tacitly pushing towards a more inclusive and participatory urban citizenry, few countries from the region have fully adopted the concept of open cities or a culture of free information sharing yet. Keeping these particularities of the MENA region in mind, this collection includes four speculative literary pieces, exploring the impact that technology and open data can have on the diverse range of women's interactions and experiences in cities. The stories are written by four women from Egypt, Palestine, and Lebanon. Each of the texts explores: open data as a tool to address developmental issue, open data as the outcome of a (social) initiative, open data skills and capacities for different social groups and urban communities or open data and policy making.

A summary of each piece is outlined below:

Author: Heba Hesham - *2048: Beyond the Female Body*

Hesham's piece explores a future scenario in which women are utilizing open data to influence online narratives about their bodies. The story is set in Cairo around 40 years in the future and follows the story of one woman whose intimate details are revealed online but who instead of being faced with shame finds a changed environment and bands together with other women to set their own rules.

Author: Lama Tawakol - *Would You Report?*

Tawakol discusses the shortcomings and drawbacks of a government-led initiative to combat sexual harassment in Egypt 40 years in the future. The initiative asks women to report all instances of sexual harassment to a platform which is connected to the government's open data base. Profiles on all men with reports are made available to everyone in addition to an open data set which includes the entire data set behind the initiative. The piece problematizes the role of the state, asks which women are being helped through the initiative, and walks us through the choices women will be forced to make when they decide to report or not.

Author: Bahia Halawi - *Karima*

Halawi tells the story of a Syrian refugee woman, Karima, who returns to a Syria whose rebuilding is driven and powered by (open) data. The story is intended as a utopian imagination of open data and

artificial intelligence's limitless potential but demonstrates also the pervasive lack of privacy that underpins such tech fantasies. The author also makes apparent how refugees serve as a testing ground for such technologies: among the most marginalized people, refugees' most intimate information is collected and shared by so many international organizations and states with disregard for their privacy rights.

Author: Marwa Fatafta - *Reclaiming Urban Spaces through Open Data in Palestine*

Fatafta's piece invites us into the story of a couple of women in Palestine and explores how they navigate the intersecting oppression of the occupation and the patriarchy. The story explores the role open street mapping can have in bringing women together to claim public space.

- **Report: "Barriers to Knowledge: The Law and Child Marriage in Egypt"**

In line with the working group's objectives and alongside the invited speculative fiction pieces, the node also sent out a call for an expert research paper on the topic of gender and data in the MENA. The call invited potential authors to explore topics relating to the use of data when representing gender, the challenges caused by the lack of availability of – and access to – open gender data, and potential pathways for the future of open data in the region. The node received a few proposals and, following a round of reviews and discussions with the authors, a chapter focusing on early marriage in Egypt by writer Reem Abuzaid was settled on.

Abuzaid's chapter delves into early marriage in Egypt as an under-researched topic and provides insights from a legal and sociopolitical standpoint. The chapter sheds light on the high level of variation in marriage practices across governorates in Egypt, making our understanding of the actual marriage process and the data we have on it very limited. The chapter further engages with the legal framework organizing early marriage in Egypt and explores the challenges that arise when mainstream assumptions and understandings of the phenomenon are reliant on data gathered through means that are inaccurate and are not representative of reality. The chapter argues that the lack of availability of accurate data, coupled with the current legal framework and a lack of understanding of the social and cultural norms that shape this phenomenon, are the major barriers that stand in the way of finding implementable and potentially successful solutions to this issue.

- **Report: Researching Gender Dynamics Within Syrian Refugee Communities in Lebanon and Jordan**

Authored by Dr. Reem Wael, this report was a reflection on the methodology undertaken during her research on gender dynamics within Syrian refugee communities. The aim of her research was to understand the role of ICTs as resiliency tools for refugees who had been displaced to Jordan and Lebanon as a result of the ongoing Syrian civil war, and the different ways that men and women in these communities use technologies to cope with their situations. This report outlined the design of the methodology and the way in which gender was made central. Dr. Wael highlighted the role of theoretical field studies as well as feminist studies in shaping the research design and helping to capture the different experiences of men and women in this crisis.

The report delves into some of the major barriers faced when conducting field research with marginalized communities that have been displaced, and the challenge of carrying out quantitative research that is reflective of lived realities and power relations between the men and women in these contexts. The report offers some invaluable insights about the diversity in experiences based on gender, age, and socioeconomic backgrounds, and sheds light on the unequal access to resources between the different subgroups that constitute the refugee communities in Lebanon and Jordan.

- **Gender and Data Working Group: Inaugural Report**

Authored by the ODMENA team, the inaugural report is a reflective piece that highlights the creation of the working group, the experience of taking on a gender consultant, the webinars and the discussions that emerged from them, as well as some of the main challenges and opportunities that were identified over the course of the year. The report also incorporates interviews with women who have studied and worked in the field of STEM in the region, highlighting their experiences and identifying patterns and correlations between the literature and the findings. The report can be used as a reference and a guide for other researchers in the region, shedding light on some of the methods of best practice observed through the working group, the major barriers, and potential pathways to overcome them, and general recommendations and advice for institutions and organizations looking to better incorporate gender into their research projects.

3.4.2. Understanding Gendered City Resilience in Jordan and Lebanon

The project was carried out by Dr. Reem Wael in close collaboration with SETS International. The main project explored resilience tools and approaches with a specific focus on city resilience to the refugee influx in Lebanon and Jordan. The project further suggested looking at this issue from a gender perspective, understanding the different experiences of men and women as a result of the deeply rooted gender ideologies and the unequal gender power dynamic that plagues the Middle East. The project looks at a very specific component**:** the role of digital technologies in building gender sensitive resilience strategies and tools to respond to the refugee crisis. The first component of the research began by exploring the gender-related challenges faced as a result of increased demand on infrastructure and resources, focusing on women's mobility and access to transportation, and how this relates to women's social and economic opportunities. It explored the resilience tools implemented to respond to these challenges, especially related to ICTs. Finally, it identified the role that data and technology have played - or have failed to play - in the resilience strategies for women's mobility and access to infrastructure, and suggested recommendations for future implementation.

The second component of the project looked at the role of digital tools in helping refugee communities to overcome barriers to mobility, and consequently to access to resources. Both regionally and globally, ICTs play a pivotal role in responses to social and economic problems. The project examined the gendered patterns of use of these tools, gathering insights from both men and women. At the same time, it took note of women's online presence in order to determine if this has strengthened their resilience as a vulnerable group in response to impediments to mobility and access to resources.

The project objectives and deliverable were completed in May 2018. The research concluded that the barriers facing women and girls are incredibly complex, and that in-depth research projects, such as this one, are required in order to fully understand these complexities and the ways in which they interweave with the opportunities offered by ICTs. Ultimately, the research found that ICTs have changed the ways in which people respond to shocks and stresses, especially alleviating the hardships of family separation and the difficulty associated with navigating resources and opportunities. Further work needs to be done in order to employ digital tools and technologies for sustainable, long-term solutions that tackle the unequal gender power dynamics that exist and open up access to resources for women.

4. PROJECT IMPLEMENTATION AND MANAGEMENT

The following section will outline the current status of each of the node's projects with regards to the milestones achieved as well as the stage at which each project currently stands.

4.1. DATA SKILLS

4.1.1. Impact Data Lab

VI completed the goals set out for the IDL program, with a focus on partnership and coalition building. They were able to identify broader areas of development within the field and recommendations through which they foresee potential for further work. The first core activity of the program was *Data Exploration and Mentorship,* underneath which participants were introduced to **data briefs** as a tool for the development of data-driven projects. This activity was supported by experts from the field of gender and education. The second core activity of the program was the *Introduction to Data Journalism Training*, which took place in both Amman and Ramallah. 71 trainees were hosted, including Jordanian and Palestinian civil society organizations, as well as researchers and journalists. Some of the organizations present included the Queen Rania Foundation, the Arab Foundations Forum, Grassroots Jerusalem, and the Union of Palestine Women Committees.

The third core activity of the program was the *Prototyping Workshop*. Participants in the program were divided into three separate thematics - or 'pods' - based on their areas of interest and relevant expertise. Participants were chosen not only based on their field, but also on the value they would bring to addressing the core themes. All in all, 16 participants across the 3 pods were present.

The team faced some challenges regarding restrictions on freedom of movement when planning for the project. Initially, VI had proposed to host the IDL in Ramallah. Ultimately, travel restrictions proved to be so significant that the team would not have been able to include several individuals they considered integral to the success of the workshop. For this reason, the workshop was shifted to Amman in order to ensure it would be as inclusive as of as many individuals as possible, whilst also maintaining a focus on data and topics relevant to Palestinians. Further, VI had set ambitious goals for the training programs it created for the purposes of the IDL. Some of the sessions proved to be too long and too complex for the amount of time that was allocated to the training. Based on their assessment of the outcomes of the project, and based on participant feedback, the team will look to focus on longer sessions coordinated with existing curriculums in future programs.

4.1.2. Data Literacy Camp

The data literacy camp took place in September 2018 with the Arab Digital Expression Foundation (ADEF), targeting youth from Egypt and the MENA region. In collaboration with ADEF, the team has recruited and selected female participants to be sponsored by A2K4D. The training sessions have been designed to cover themes related to data science, data analysis and extraction, data visualization and digital security tools.

Through this collaboration, the A2K4D team has built on ADEF's long experience with designing and conducting data literacy camps for youth, as well as the team's own experience with data trainings for women in Aswan, the latter of which was undertaken as part of the OD4D's funded activities in 2017.

In addition to the supporting of selected female participants, the team at A2K4D has also received written pieces by each of the sponsored participants, shedding light on the best practices encountered in the camp and some of the main challenges facing women in digital knowledge production from the MENA region. These pieces are intended to capitalize on future camp designs for women and youth in the region, bearing in mind the skills gaps that need to be addressed in addition to the enabling learning environments preferred by young practitioners.

4.2. POLICY

4.2.1. Developing Data-Driven Innovation for Policymakers, Stakeholders and Researchers

At this stage of the project, the data innovation platform is live. The platform aims to ensure that policymakers and researchers have access to credible health data that would help them in making informed decisions. Thus far, the development of the platform has covered the following stages:

- Identification of Indicators: A review of the health system's key indicators has been undertaken. The review included a wide range of sources to ensure comprehensiveness and diversity of the indicators used. The list below outlines the sources used for selecting key health system indicators:

  - OECD Health Statistics
  - Canadian Chronic Disease Indicators 2017
  - Canadian Institute for Health Indicators
  - Sustainable Development Goals health indicators
  - UNHCR Dashboard on Syrian refugees
  - Ministry of Public Health Lebanon
  - Medical Syndicates in Lebanon
  - National Health Account in Lebanon
  - Central Administration of Statistics in Lebanon (CSA)
  - National Security Fund in Lebanon (NSSF)
  - WHO Global Health Observatory

- Stakeholder Consultation: Representatives from select ministries such as the Ministry of Health, Ministry of Social Affairs, Ministry of Education and the Ministry of Labor were consulted on the the process of prioritizing indicators. Other stakeholders such as representatives from NGOs, national medical, nursing and pharmacist associations, researchers, academics as well as media representatives were included in the stakeholder consultations for a wide-range of perspectives and expertise to be considered. At this point, the platform focuses specifically on information on cancer, rather than other medical ailments.

- Identification of a data registry: Following the prioritization of indicators as set with the relevant stakeholders, a select sample of indicators was chosen for the data visualization platform. This is primarily from the National Cancer Registry available at the Ministry of Public Health.
- Development of platform concept: Following the assessment and selection of indicators, the platform concept and design were decided on. The design of the platform is fairly straightforward and easy to use, while the graphs are interactive, allowing the user to select datasets by age, year, and gender, as well as being able to compare multiple datasets.
- The K2P team has also populated the open data management plan designed for the OD4D MENA node. The ODMP aims to streamline responses on the impact, use and challenges of using open data throughout each of the projects. Currently, the Health SystemEye is not yet fully integrated into the MENA Data Platform, but this is underway as A2K4D is in conversation with the K2P team in order to finalize this collaboration.

4.2.2. Igniting the OD4D Maghreb

The core project objectives and deliverables for this project were
a) A meeting bringing together the key stakeholders from civil society organizations to discuss gender inequalities and gender discourse in the region
b) The development of a report on gender equality and related debates as portrayed by media in the Maghreb Region based on insights gained from the meeting
c) A corresponding policy brief that was to be crafted based on the findings of the report

The project objectives and deliverables were initially completed in May 2018, and – given the promising results from the period, and upon consultation with the Innova team – a second project phase covering Egypt, Lebanon, and Jordan was decided upon. Given the ongoing work of OD4D in Egypt and Lebanon, and the growing interest in open data in Jordan, these countries were identified as ideal for replicating the previous methodology. The project outputs for the second round were a) the development of an analysis paper measuring the impact of gender equality policies and their perceptions in the three countries, and b) an accompanying policy brief contextualizing the research within the policy framework.

Following the same methodology utilized for the first round, the team was able to create an analysis paper of public sentiment towards gender and gender portrayals in the media in the three countries. Their approach involved the use of innovative methods, whereby they collected a large sample of public content from the internet and applied text-mining techniques to extract and identify the different types of content. Prior to the collection of the content and data, the team manually annotated the top 10,000 most frequent words in Arabic, English, and French – the three most used languages in the region. Following this activity, the words were categorized into 'positive', 'negative', and 'neutral', and – through natural language processing algorithms – the WebRadar technology was then able to determine the language of each piece of content and the general tone.

The second round of deliverables included the development of an analysis paper and a policy brief, the findings of which are both outlined in the *Research Findings* section of this technical report. Moving forward, the hope

is to utilize these documents to set a benchmark for understanding how the media portrays gender issues and general public sentiment in the region.

4.3. URBAN INFRASTRUCTURES

4.3.1. Developing Air Quality Heat Map in Cairo: A Citizen Centric Approach

The research team conducted a mobile data collection campaign in Cairo to collect traffic related air pollution data, focusing specifically on black carbon (BC). Each mobile measurement was performed using a car equipped with a cellphone where an advanced GPS tracker application is installed, and a BC measurement sensor is fixed, as shown in the figure below.
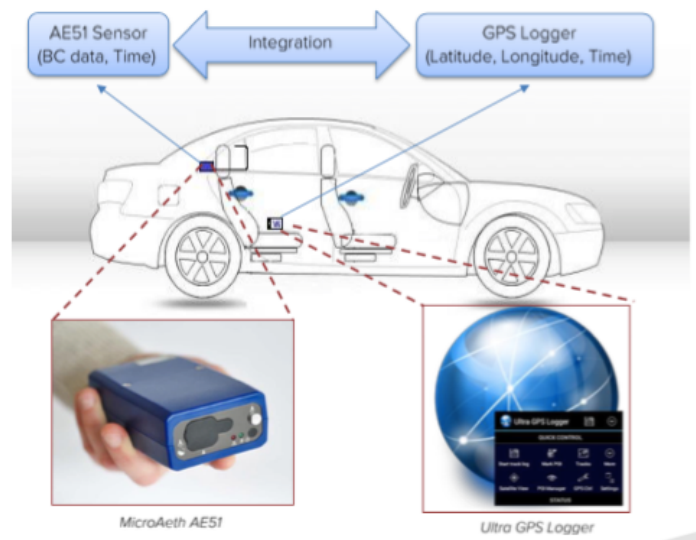

Figure 16: Measurement Process

Following the design of the experiments, the research team proceeded to the mobile data collection phase. The data collection campaign was designed to capture representative conditions for mapping air quality. Those included a number of factors:

- Ensure capturing different types of land-uses (residential, industrial, etc.)
- Ensure covering the different classes of roads (highway, arterial, local, etc.)
- Ensure maximum possible geographic coverage within Greater Cairo
- Ensure travelling through various traffic patterns throughout different times of the day

The data collection campaign ran between May 2017 and August 2017, whereby each of the selected routes were travelled around 6 to 9 times. Following the analysis of the collected data through considering road class variation, spatial variation, and route variation, map visualizations were created to help better capture the distribution of BC concentration across Cairo's roads and neighborhoods. The map below shows results of a single monitoring visit.
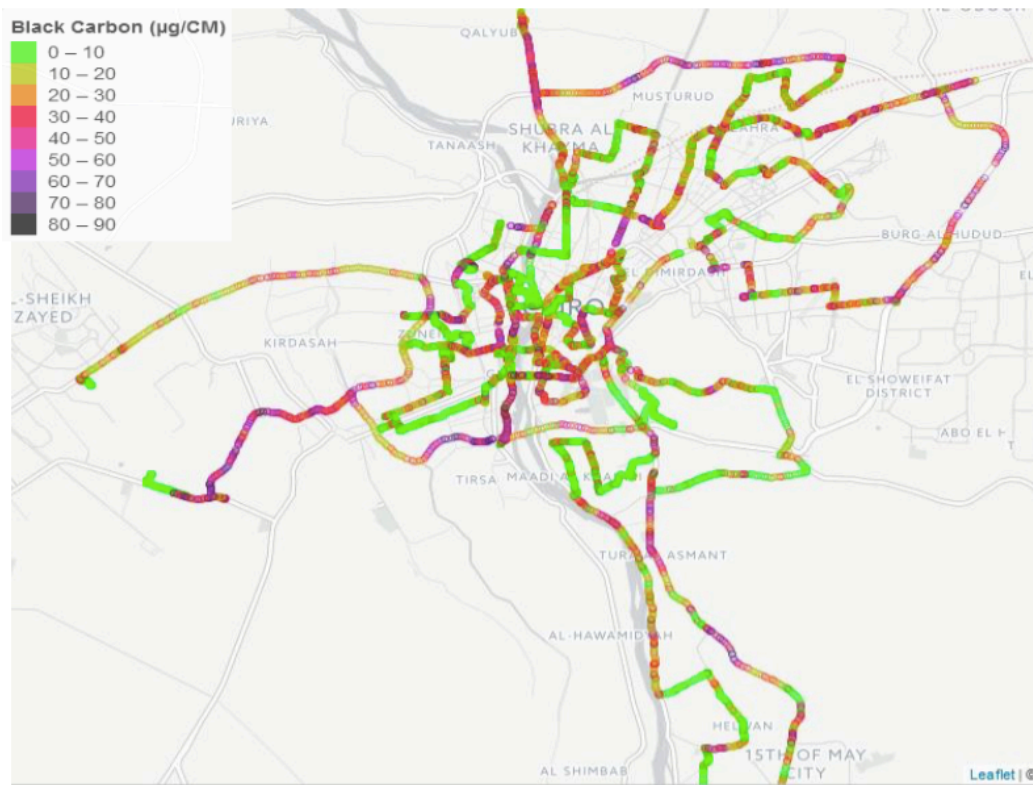
Figure 17: Results of a single monitoring visit in Greater Cairo

Current results show that, when compared to the maximum recorded BC in cities like Belgium and Pittsburg, the descriptive analysis of the collected data shows an alarming 4 to 5 times order of magnitude "average" measured BC concentration in Cairo.

The next step of this project involved preparing a database including information on land-use, population density and measured BC concentrations. The map of Greater Cairo was split up into cells of 50 x 50m, and the land-use distribution of each cell was calculated and inputted into the database. The same was done for the population density of each cell.
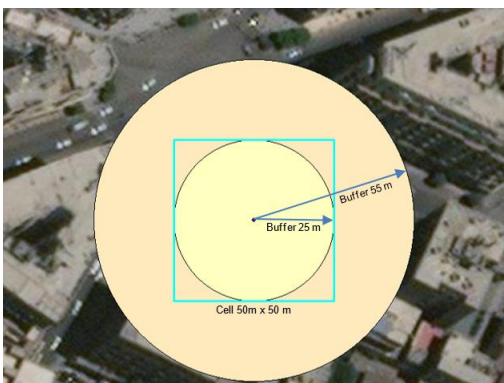

Figure 18: Generation of Cell Size (50 x 50 m) and Buffer

Figure 19: Example of Cell Mapping along Tahrir Square

The data was then integrated with the BC concentration data collected in order to develop a regression model that was based on land-use and population density.

4.3.2. Understanding city resilience within MENA in relation to SDGs and availability of Data

The research team successfully completed their review of the different city resilience frameworks, reviewing, adopting, and synthesizing concepts and indicators from a multitude of popular frameworks such as the Grosvenor City Resilience Score, the Organization for Economic Cooperation and Development (OECD) indicators of resilient cities and the Rockefeller City Resilience Index framework. Following the review of the frameworks, the team developed a Resiliency Reinforcement Strategies Database (RRSD). The database, intended to bridge the gap in knowledge pertaining to city resiliency in the developing world, includes different cities, their respective resiliency goals, the appropriate resiliency indicators for each, as well as the implementation time frame and the implementing agencies. In addition to developing the RRSD, the team also developed an online open data repository where the RRSD is housed and can be continuously edited and added to.

Furthermore, the research team analyzed resiliency reinforcement strategies in the MENA region. The cities in question are Amman and Beirut, with a particular focus on the effects of the Syrian refugee crisis on both. The resiliency indicators for Amman and Beirut include elements such as climate change, energy shortage, infrastructure failure, pollution, and transportation system failure.

The figure below demonstrates the ways in which resiliency indicators are matched with the respective sustainable development goals (SDGs) in the cases of Amman and Beirut. The visualization below shows an example of how the data is displayed on the web portal. It demonstrates how resiliency strategies are contextualized in the case of the MENA region.
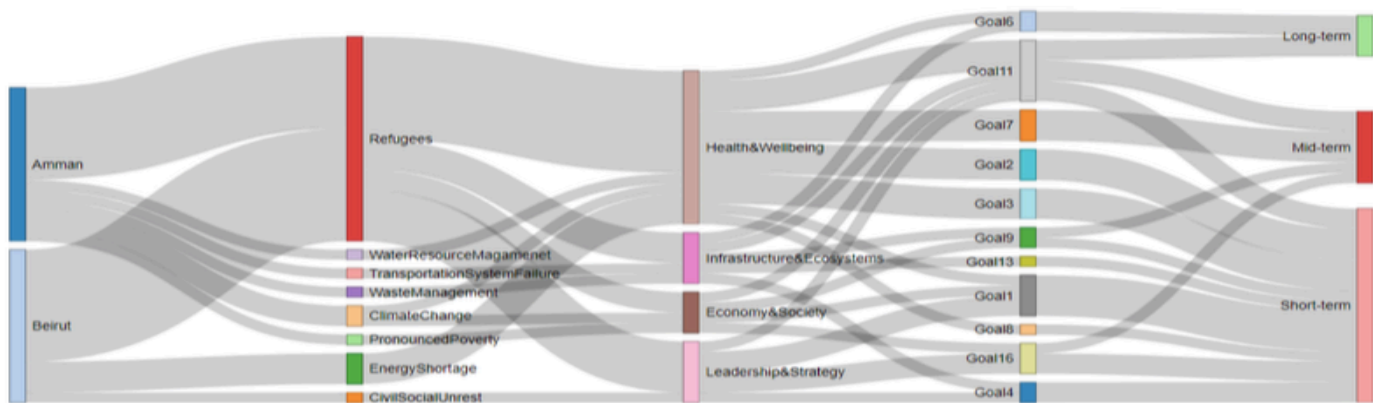

Figure 20: Visualization of the RRS for the cities of Amman and Beirut

4.3.3. Data Driven Mobility in Cairo

The aim of the urban mobility research track is to produce knowledge and disseminate findings and analyses among the wider community working in the field of sustainable urban mobility in the MENA region. Currently, one journal article, titled "Data and Urban Mobility Planning in Developing Cities: A Case Study from Cairo" has been submitted for publication consideration to the *Urban Affairs Review Journal*. The article builds upon research conducted by the team in Cairo on the quality of movement on the region's most popular and most heavily used urban expressway, the Cairo Ring-Road.

The article touches upon the critical issues of accessing data on informal transportation activities, with the aim of understanding the potential of their integration within wider mobility plans. Additionally, the research demonstrates and discusses a select number of innovative and novel tools that can be used for accessing data where official numbers are scant or non-existing. These tools that can aid in transforming collected data-sets into policy plans, informing future research and urban mobility advocacy work.

In addition, one blog post has been written. The blog touches upon the future of smart cities and their potential in capturing data through technological means, enhancing residents' engagement with policy plans and city design processes in an attempt to question the process of 'data democratization'. The blog post is hosted on the OD4D MENA Data Platform for wide use and dissemination by a range of relevant stakeholders.

Finally, thematic visualizations building on research and data collected by the team have been successfully developed and are being disseminated on social media and throughout the center's networks. The visualizations aim to contribute easy-to-read data study findings through clear infographics that are readable by users at varying levels. Below are one examples of the infographics produced by this research track.
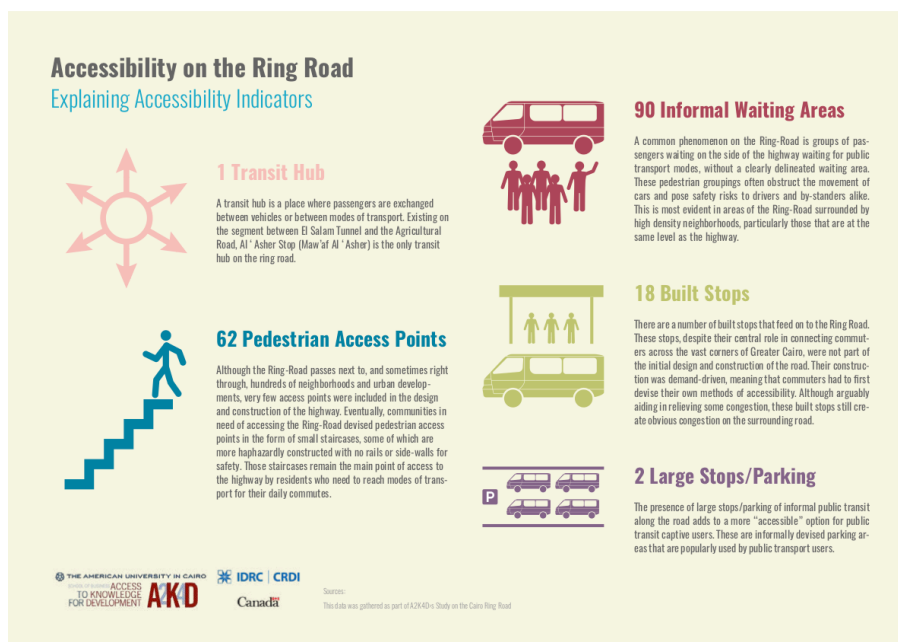

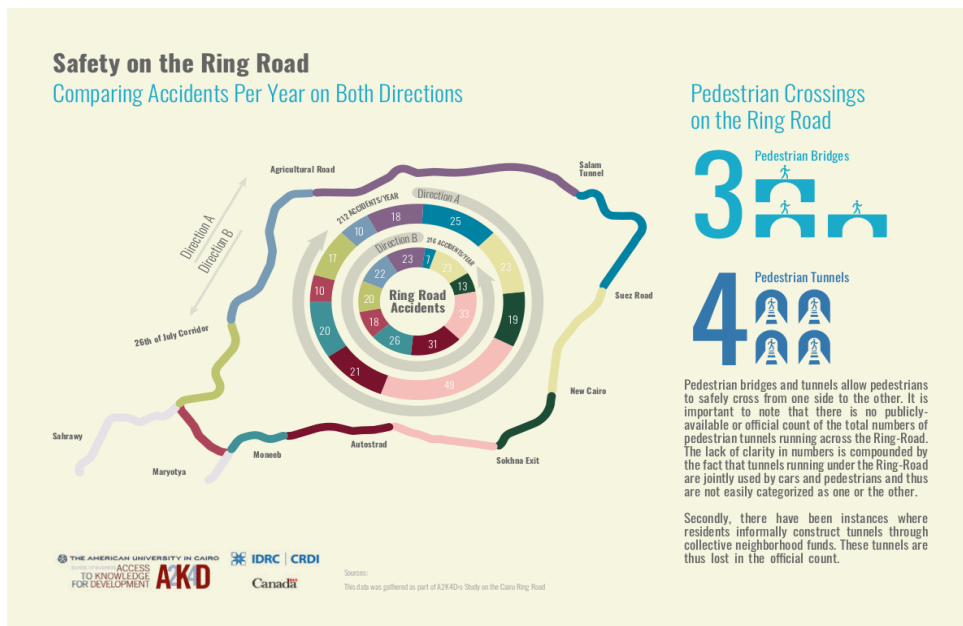*Figure 21: Accessibility Indicators*

Figure 22: Safety levels and Indicators on the Cairo Ring Road

4.4. GENDER

4.4.1. Gender and Data Research Working Group in MENA

The node has been successful in bringing together stakeholders and experts, both from within the field of gender and data and from outside of it, to create a working group in the region. With the help of Dr. Reem Wael, the working group convened virtually to discuss key topics surrounding gender and data in a series of webinars. The notion of open data was at the center of the discussions so as to explore its potential role in improving gender research in the region, as well as the role of technologies in this type of research. Three webinars were held, targeting both academics and professionals, in order to capture the theoretical and practical experiences related to data and gender. Attendees of the webinars represented a variety of institutions and professional organizations such as the International Finance Corporation (IFC), IDRC, and independent consultants.

A call for chapters and thought pieces was sent around to members of the working group, as well as through various mediums and channels such as personal networks, public posts online, and emails to professional networks. A number of proposals were sent in and reviewed by the team before the final pieces were decided upon. Throughout the writing process, authors of these pieces were provided supported by the ODMENA team, including feedback on structure and content. As outlined in the Research Findings section of this report, the main outputs have been completed. They are outlined below, alongside steps forward for each milestone:

- **The Gender and Data Seminars**: After the initial 3 webinars, moving forward, the node envisions holding further webinars that tackle contemporary challenges facing the gender and open data community. In future rounds of the OD4D project, the node hopes to have wider outreach with further varied representatives and even higher rates of attendance.

- **Short Pieces: Speculative Data Futures:** The four invited pieces and the expert chapter have been reviewed and have undergone final edits from the team. They will be housed on the node's open data website, the MENA Data Platform, where they will be made readily accessible and easily sharable between the working group, the wider OD4D network, and the public.

- **Gender and Data Working Group - Inaugural Report:** The inaugural report will be made available on the MENA Data Platform and will be shared within the ODMENA's network and the public. The report will also refer to resources outside the working group that individuals and organizations can use to mainstream gender in their open data projects.

4.4.2. Understanding Gendered City Resilience in Jordan and Lebanon

Prior to conducting on the ground research, a literature review was carried out to investigate the state of, and accessibility to, infrastructure in Lebanon and Jordan, with a specific focus on the few years following the refugee influx. Data was extracted from state reports, as well as reports and news published by international organizations and NGOs. The gaps in the data that were identified were then filled in by the in-depth interviews carried out in the on the ground research.

Initially, the research had been designed as a comparative study of experiences from inside a refugee camp, particularly Za'atari in Jordan, and experiences of urban refugees in Lebanon. However, the team faced security challenges and were unable to enter the Za'atari camp. Instead, the study focused on two communities in different social milieus: Syrians living south of Beirut and in scattered semi-urban settings, and Syrians living in Al-Mafreq, Jordan which is a small and contained city, on the border of Syria.

In order to fulfill the project objectives, the SETS team worked closely with Dr. Reem Wael to carry out the research in Jordan and Lebanon. The division of focus between Jordan and Lebanon helped provide insights on both countries and highlighted the difference in women's mobility and access to infrastructure in the context of the refugee camps and the host communities in which they assimilated. In-depth interviews having been carried out with staff members from UNHCR, Save the Children, CARE, Mercy Corps, and the International Rescue Committee organizations, in addition to stakeholders in the transportation sectors in the targeted regions. Most interviews were carried out in person, with a few having taken place over Skype.

Further, five focus groups in each of the two countries were also carried out with both men and women. The focus groups were divided by age in order to capture the differences in experiences and approaches between the 'youth' and the middle-aged. A contrast between life in camps and in cities was stressed upon. It was crucial to include the perception of men, not only to understand their patterns of ICT use in contrast to women, but also to grasp their perception regarding the gendered experience in access to ICTs among refugee communities, and whether these opinions reflect the lived realities of women.

5. PROJECT OUTPUTS AND DISSEMINATION

NODE OUTPUTS

COMPLETED

URBAN INFRASTRUCTURES

- Understanding City Resilience in the MENA region final report

- Data-driven mobility in Cairo: Journal Article

- Data-driven mobility in Cairo: Data Visualizations

- Mapping Air quality in Cairo: Final Report

POLICY

- Health System Eye Platform: Open Health Data in Lebanon

- Gender sentiment analysis of media in Algeria Egypt, Jordan, Lebanon, Morocco and Tunisia: Policy Briefs

CAPACITY BUILDING

- Gender and Data Working Group MENA: Webinars

- ADEF Data Literacy Camp in Lebanon

- Impact Data Lab and Final Report

NODE OUTPUTS

COMPLETED

GENDER

- Gender and Data Working Group MENA: Data Visualizations

- Gendered city resilience in Jordan and Lebanon Report

- Case Study: Data Practices in Measuring Early Marriages in Egypt

- Gender sentiment analysis of media in Algeria Egypt, Jordan, Lebanon, Morocco and Tunisia: Final Reports

- Gender and Data Working Group MENA Inaugural Report

- Short Pieces: Speculative Data Futures

- ODMENA Gender Consultant: Reflections on Gender Methodologies

- Gender and Data Working Group MENA: Webinar Reports

Figure 23: OD4D MENA Node Outputs

5.1. Outputs for the period:

COMPLETED PROJECTS

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1. **Resilient Cities, SDGs, and Data in MENA:** This initiative undertaken by *SETS, Egypt* research on the role of data in working towards measuring, improving, and documenting city resiliency in countries of the MENA region. Resiliency indicators were analyzed in relation to the Sustainable Development Goals for more context and relevance. Specifically, comparative analyses between Beirut and Amman were conducted offering a glimpse of resiliency levels in the region.

2. **Impact Data Lab:** organized by *Visualizing Impact* in March 2018 in Jordan, included data exploration, training sessions, and a hands-on prototyping workshop. Three themes — education, gender, and digital rights in the West Bank and East Jerusalem — guided IDL's content focus. The team successfully collaborated with four civil society organizations to explore complex and challenging data on the three chosen themes and delivered trainings to 71 people in Amman and Ramallah. At the end of the IDL, concrete prototypes were developed that represented unique ways of applying and disseminating data. Each of the three pods produced and presented a draft during the workshop.

3. **Mapping Air Quality in Cairo:** The project led by *SETs Egypt*, created a heat map for Greater Cairo, mapping the concentration of Black Carbon (BC), which is considered one of the most prominent pollutants effecting respiratory systems and over-all health. The map used a land-use regression model: through the creation of the land-use regression model, the research team was then able to input all the variables effecting the concentration of BC in the air within Greater Cairo into a visualization, demonstrating differences in BC concentrations based on route type, respective land-use, and different traffic patterns.

4. **Gender Sentiment Analysis – Algeria, Morocco, Tunisia:** Alongside a workshop and policy brief, *Innova Tunisia* produced a 'Data-Driven Study of Gender Discourses in the Maghreb Region'. This paper uses online data to analyze media portrayals of gender inequalities and other gender related debates in the Maghreb region. Additionally, the team created a policy brief that reviews key findings from the report and is written in accessible terms for dissemination to policy makers.

5. **Gender Sentiment Analysis – Egypt, Jordan, Lebanon:** In the previous period, Innova Tunisia carried out a second phase of the Gender Sentiment Analysis initiatives in Algeria, Morocco, Tunisia. The countries of focus in this phase was Egypt, Jordan, and Lebanon. Specific deliverables include a Gender and Media Report: Egypt, Jordan and Lebanon and a corresponding policy brief for dissemination of findings.

6. **Health SystemEye:** A project led by the *Knowledge to Policy Center (K2P)* at the American University in Beirut to a create an online platform 'Health SystemEye' that disseminates and visualizes health data and information about Syrian refugees in Lebanon to policymakers. Data sources and visualization

methods have been chosen, and a first draft of the platform has been delivered. The platform has also gone live on http://www.healthsystemeye.com. Additionally, feedback will be sent to AUB's team in order to modify the platform accordingly:

- o The platform is live but still needs to be updated and include more content, for example in the infographics section;
- o The platform has some open access issues in regards to the research content;
- o There needs to be more information on the Syrian refugees whose data was collected.

As part of the aforementioned report submitted in August 2018, K2P has mentioned 'lessons learned' throughout the project that are worth mentioning here. These revolve mostly around the difficulties of creating an open data project in an area where the culture of openness regarding data is not yet entrenched. For example, the challenges they mention are:

- Persuading stakeholders that open data is more beneficial to society and policy-makers, particularly with regards to health information;
- Finding a qualified software engineer that understood the particulars of the platform and its commitment to open data;
- Making the platform interactive and user friendly;
- And finally, working on enabling users to access the raw data because currently it is not accessible from the Health SystemEye platform.

Ultimately, K2P's platform is a significant example of the way that data utilization and visualization can be a means to address policy change and reach out to stakeholders who need valuable information in order to make effective changes. This is crucial at a time like this where the Syrian refugee crisis has impacted the entire MENA region. It is also crucial because it addresses one of the biggest challenges facing many countries in the MENA, namely the availability of credible, reliable, and up to date data, especially on medical ailments. Therefore, A2K4D hopes that this platform will be a valuable resource for the MENA Data Platform, in order to keep conversations going on health and other critical issues affecting the region.

7. **Gender and Data Working Research Group MENA:** The group has held three interactive webinars over the course of the project. Findings and results from the webinars are released in a MENA Open Data and Gender report. Alongside these webinars, the node also sent out a call for speculative fiction pieces as well as an expert piece on gender and data in the region. As a result, four speculative fiction pieces were undertaken by consultants, alongside an expert piece on early marriage in Egypt and a methodology report on research fieldwork when exploring gender dynamics in refugee communities and settlements in Lebanon and Jordan.

8. **Data-Driven Mobility in Cairo:** The manuscript titled, "Data and Urban Mobility Planning in Developing Cities: A Case Study from Cairo" has been submitted for publication consideration to the Urban Affairs

Review Journal, focusing on alternative methodologies for accessing otherwise inaccessible data, and how those could be used for better integrated mobility planning in Greater Cairo and other cities of the global south. In addition, the team has produced a number of infographics and visualizations for wide dissemination among groups working on, or looking to increase their knowledge of urban mobility, challenges and processes in Egypt and the MENA region.

9. **Understanding Gendered Resilience in Jordan and Lebanon:** This project, led by *SETS Egypt,* explored the forms resiliency takes in ICTs, and the role of digital technologies in building gender sensitive resilience strategies and tools to respond to the current Syrian refugee crisis. The final report investigated the potential for digital tools in helping refugee communities overcome barriers to mobility, and consequently access to resources.

10. **ADEF Data Literacy Camp:** As part of the project's capacity building efforts, the data literacy camp undertaken with ADEF has provided the opportunity for women at different professional levels from the MENA region to capitalize on and grow their digital skills in areas like the arts, social development, storytelling, and journalism. The reflection pieces produced by the participants will serve as a resource for managing best practices in disseminating digital skills, building educational modules, and identifying challenges and areas of need, especially as they relate to women from the region.

5.2. Dissemination

Dissemination initiatives for the past period have taken place through two main events: The International Open Data Conference and the Access to Knowledge for Development Center Annual Workshop.

5.2.1. IODC

Representatives from the ODMENA and its regional partners attended and participated in various events throughout the 5th Annual International Open Data Conference (IODC), in Buenos Aires, Argentina. Under the theme of "The Future is Open", the week-long conference took place from the 24th to the 28th of September and included several pre-conference events alongside two days of panel discussions. The pre-events and panels consisted of a range of interactive sessions, workshops, and discussions. It was organized in partnership between the Argentinian Government, the IDRC, the World Bank and the global initiative for OD4D.

The goal of the conference was to bring together a diverse community of participants from the northern and southern hemispheres to showcase innovative open data solutions, explore opportunities and challenges, consolidate strategies that shape the open data agenda, and explore potential partnerships and collaborations that will translate into measurable impact. Global representatives from governments, academia, the private sector, and civil society shared lessons learned in addition to a wealth of successful initiatives in open data, with a specific emphasis placed on data for development.

Five ODMENA representatives took part at IODC, representing the node's partners across the region. These included:
- Abir Cherif, a data analyst and socio-political consultant at WebRadar, representing the node's partner in Tunisia working on sentiment analysis and policy;
- Clara Abou Samra, an evidence lead specialist at the Knowledge to Policy (K2P) center at the American University of Beirut, representing the node's partner in Lebanon working on data-driven innovation initiatives for health policy;
- Marwan Tarazi, Director of the Center for Continuing Education at Birzeit University, representing the node's partner in Palestine focusing on education reform;
- Nancy Salem, the coordinator of the ODMENA node and a senior researcher at the Access to Knowledge for Development Center (A2K4D) working on a range of open data for development projects and initiatives;
- Youmna Hashem, a researcher at A2K4D focusing on the gender work being undertaken by the ODMENA node.

The representatives all participated in the Open Data in the Middle East and North Africa regional panel, where they spoke to the regional diversity of open data initiatives in their respective organizations. Each panelist discussed work undertaken in the previous two years, highlighting initiatives relating to Data Skills, Urban Development, Gender, and Policy. An emphasis was placed on gender inclusivity and effective sustainable development policy, reflecting on priorities moving forward. The discussion noted that while the open data agenda is taking form in the region largely as part of national digitalization strategies that encourage its adoption, key challenges still persist. The main barriers identified were those relating to data scarcity, and the lack of data governance practices which affect the quality and timeliness of the available open data. The session ended with a facilitated discussion between the panelists and the audience members, whereby the future of open data and the potential for streamlined regional efforts for sustainable impact were discussed.

Figure 24: Left to right: Nancy Salem, Clara Abou Samra, Abir Cherif, Youmna Hashem, and Marwan Tarazi.

Additionally, Salem also served as a co-facilitator for a session titled "Data Ethics and AI: Intersecting for Digital Equality". Organized by the World Wide Web Foundation, the session discussed the role of open data and artificial intelligence in creating frameworks of digital opportunities and digital equality. Leading a breakout group on AI in the Global South, Salem's discussion centered around two key arguments: the barriers facing the implementation of AI in Africa, and the risk of lagging behind. Salem's first argument delved into the critical challenges that stand in the way of the full realization of open data in Africa, focusing on issues surrounding infrastructure, access to technology, and skills. The second argument – a counter-argument – explored the risks associated with the continent falling behind and being left out of the global AI and open data conversations. The group discussion was varied, with some participants arguing that AI is decades away from being fully actualized globally and that Africa does not stand to be negatively affected, and others arguing that the global south runs the risk of being left out of global debate.

5.2.2. A2K4D Workshop

ODMENA participated in the A2K4D annual workshop entitled "Digital Technologies, Innovation, and Inclusive Growth: Alternative Narratives." Over the two-day workshop, the node also hosted its final partner's meeting in Cairo. Both events are detailed below:

a. Partner's Meeting

On October 17, 2018, ODMENA held a project partners' meeting in Cairo. This consisted of an exercise around assessing activities and outcomes for the duration of the project and defining priorities for the next phase of OD4D in the region. The purpose of the session was to tease out specific project objectives, activities, and opportunities to collaborate between partners in the room. The next phase of OD4D will aim to focus on community building, capacity building, and research, all with a cross-cutting focus on gender.

Representation from the following organizations were present at the meeting:

Country	Organization	Useful Link	Information
Tunisia	Innova Tunisia	https://www.idara.tn	One of the examples of Open Data in Tunisia that Innova are working on mapping
Egypt	SETS, North Africa	https://setsintl.net/page/projects/	

Lebanon	Nature Conservation Center, American University in Beirut	https://www.daskaraapp.com	One of the ways through which AUB's Nature Conservation Centre are using data and tech to preserve heritage and environment.
Morocco	ICT4D Center, Mundiapolis University	http://govright.org	An example of the intersection between data, law, governance, and citizen engagement
Palestine	Visualizing Impact	https://visualizingpalestine.org and https://palopenmaps.org/#/	One of Visualising Impact's biggest projects - Visualising Palestine

During this session, participants discussed priorities, challenges, and opportunities. In specific, two priorities moving forward were identified:

- Sharing Resources:

The sharing resources group mainly focused on the MENA Data Platform that A2K4D is initiating, looking at some important questions on how to ensure its diversity but also its inclusion of the data-intensive work being done across the MENA region.

- Capacity:

The capacity building group mainly focused on the importance of capacity building for stakeholders and for end users. The group discussed some of the initial steps that need to be taken in order to ensure the success of capacity building initiatives, and the importance of determining scale before exploring activities.

Moving forward into new OD4D work, two action items were identified:

1. Call for participants of the workshop to send work they would like to include on the MENA Data Platform
2. Call for proposals for potential collaboration between participants of the meeting

b. Public Event

Alongside the partner's meeting, ODMENA also held two panels to disseminate findings from the previous period. Both sessions are outline below:

Session 1 - New Frontiers: Gender in the Age of Data
  Moderator: Nancy Salem, Senior Researcher, A2K4D, School of Business, AUC
  Panelists:
- Yosra El Gazzar, Information Designer, Visualizing Impact
- Abir Cherif, Senior Marketing and Socio-Political Consultant, Innova Tunisia

- Youmna Hashem, Researcher, A2K4D, School of Business, AUC
- Sarah Rizk, Project Coordinator, SETS North Africa

Overview:

The session aimed to shed light on some of the concerted efforts for gender inclusivity in data that have taken place over the past year in the ODMENA network. The panelists discussed the importance of incorporating a gender lens in data collection, highlighting some of the intersections between gender and data, and sharing their experiences and findings so far. The session also aimed to explore some of the major barriers facing gender inclusivity in research, including the lack of awareness and lack of understanding of the importance of gendered data and research, and the role they play in painting a holistic image of men and women's realities.

Speaking about the city resilience project, Sarah Rizk delved into the different measurements of resiliency, how cities are able to employ unique strategies to handle shocks relating to urban challenges, and how these strategies can be mapped into the SDGs. Taking on a gendered perspective of city resilience, Sarah and her team were able to identify some of the barriers to movement facing women in the midst of the Syrian refugee crisis, and barriers to access to information and technology. In doing so, the research was able to identify the different tools and methods of remediation needed by men and women in order to overcome the challenges that they face as a consequence of their environment.

Abir Cherif gave a more technical perspective, outlining her project's experience in collecting data from the webosphere and generating insights on public sentiment regarding gender in the Maghreb region. The aim behind the project was to analyze public sentiment towards new gender policies that were being introduced to the region, and to create a comparison between whether the sentiment the media portrayed matched the sentiment on the ground. Cherif went on to explain that the scope of the research was gendered from the get-go, which resulted in the design of research questions that were inclusive and mindful of different perspectives.

Yosra El-Gazzar spoke about her project which worked closely with data technology and design in order to tackle issues of social justice in Palestine. Through Impact Data Lab, a workshop aimed at strengthening data skills and building capacity around data, El-Gazzar and her team were able to dedicate a large component of their work towards gender and data in Palestine; at the end of the workshop, they were able to produce a visual prototype. Their research looked at how the Israeli occupation affects women and men differently in Palestine and explored the most effective ways to visualize this information in easy-to-understand infographics.

Youmna Hashem spoke about the different ways through which the A2K4D center has been working on mainstreaming gender into its projects, and the main outcomes that emerged as a result. With the help of a gender consultant, the center was able to create a Gender and Data working group, which comprised of individuals representing a wide range of disciplines and

organizations. Hashem explained that one of the biggest challenges facing the region is quite simply the lack of awareness surrounding the importance of having a gender component in data, and the massive benefit this exercise can bring to communities and societies.

Session 5 - The Data Pipeline: Collection, Visualization, and Dissemination
Moderator: Yara Sultan, Senior Research Specialist, A2K4D, School of Business, AUC
Panelists:
- Hussein Mahfouz, Researcher, A2K4D, School of Business, AUC
- Hossam Abdelgawad, Director of Transportation, SETS North Africa
- Amr Eleraqi, Co-founder and CEO, Infotimes
- Nancy Salem, Senior Researcher, A2K4D, School of Business, AUC

Overview:

To harness the benefits of data, senior researcher Yara Sultan examined ways to collect, visualize, and disseminate data with guest speakers Hossam Abdelgawad, Director of Transportation at SETS International, Amr El Eraqi, Co-founder and CEO of InfoTimes, Hussein Mahfouz, Researcher at A2K4D, and Nancy Salem, Senior Researcher at A2K4D. The panel addressed the importance of collecting accurate and verified data, communicating it through engaging visuals and infographics, and disseminating it across the region to find solutions for pressing challenges.

Overall, the panelists discussed the advantages and opportunities that come with open data, as well as some of the key issues to keep in mind. They also highlighted the ways in which the outputs can be put in visual formats rather than traditional text format. According to Eleraqi, the way journalism takes place has changed and evolved to become more visual rather than long pieces. These visuals contain deep content - i.e., they are evidence-based. This helps in reaching a wide range of people. From his point of view as a digital journalist, our society still does not have a visual culture, as data is new to us; we need new ways of narrating.

Mahfouz builds on this by presenting his viewpoint on why visualizing data plays a significant part in sharing research outputs. Based on his research, which covers urban mobility, commuting on the ring road is a problem but, working with Sultan, they looked to understand its core problems. Most of literature does not take into account developing countries, they therefore had to develop their own methodology. After collecting data through both fieldwork as well as sources of data such as Google Traffic, Bey2ollak (an Egyptian app that allows drivers to see how congested the roads are), and CAMPAS (the Egyptian Census Bureau), they worked with a graphic designer to create visual representations of their research findings.

According to Salem, we think about open data as an ecosystem; we can't stop at collection as we need to ask critical questions about what this data signifies. What is hidden and displayed by your data? We must think of our biases - who you haven't asked about your data - gender, race,

class - in short, intersectionality. The other question we need to ask is, are we crossing any boundaries? Especially when you're collecting sensitive data, you need to ask yourself these questions. Who is going to use that data and what is it going to be used for? Open data is linked with a lot of questions and problems. There is no one way to think about this, but in terms of adoption, openness is contextual. Is openness an end goal or is it in the process of your end goal? Ultimately, Dr. Hossam's comment concludes: everyone benefits from open data. The conversation gets bigger once the data is open.

5.2.3. Other Knowledge Mobilization Events

In addition to these primary events, the ODMENA team also participated in knowledge mobilization events during the past two-years:

- *FORCE 11 Scholarly Communication Institute, San Diego United States, July 30 – August 3, 2018.*

A2K4D researcher Nancy Salem attended FORCE 11 Scholarly Communication Institute (FSCI) held at the University of California, San Diego. Salem's participation in the week-long summer training course was supported by A2K4D and the International Development Research Center (IDRC). FSCI includes coursework, seminar participation, group activities, lectures and hands-on training held by global experts in scholarly communications.

- *Feminist Open Science Workshop Agenda, June 19 - 22, 2018, University of Toronto*

A2K4D researcher Nancy Salem attended Feminist Open Science Workshop held at the University of Toronto from June 19 - 22, 2018. The workshop was held by the Open and Collaborative Science in Development Network (OCSDNet) and the International Development Research Center (IDRC).

- *Towards an Agenda for Internet Governance in Egypt Round II, The American University in Cairo, September 4, 2018*

A2K4D hosted a second meeting to discuss a potential Agenda for Internet Governance in Egypt. During the closed meeting, A2K4D discussed a proposed framework of issues based on the topics suggested by the stakeholders during a first roundtable. Under the overarching theme of inclusive growth and digital

transformation, participants agreed to focus on two main topics in working groups as well as a set of events. The topics for the working groups are on one hand Internet infrastructure and Inclusive Growth, and on the other hand Artificial Intelligence and Digital Transformation.

- *IDRC Networked Economies Partners' Meeting, September 19-21, 2018*

A2K4D Researchers Nagham El Houssamy and Nancy Salem actively participated in the International Development Research Center's (IDRC) Networked Economies (NE) Partners' Meeting that took place in Ottawa, Canada. The meeting focused on improving gender inclusivity and mainstreaming across IDRC projects, and included a workshop lead by non-profit organization Gender at Work.

- *United Nations Data Forum, Dubai United Arab Emirates, October 22-24, 2018*

Researcher Nancy Salem participated in the annual United Nations Data Forum in Dubai from October 22-24, 2018. The forum hosted several panels and workshops by a multi-stakeholder data community. Salem shared information about the work of the Open Data for Development (OD4D) Middle East and North Africa node at A2K4D.

5.2.4. MENA Data Platform

All outputs of the node will also be hosted on the MENA Data Platform, an online open-source web portal that has been launched by the center. As well as hosting all of the outputs of the OD4D project, the platform will also allow researchers working in the MENA region to upload and share their own work, data sets, blogs, news. and events. The platform aims to foster an open data community in the region and currently hosts projects relating to transportation and urban mobility, renewable energy, gender, urban planning, health, education, and data skills.
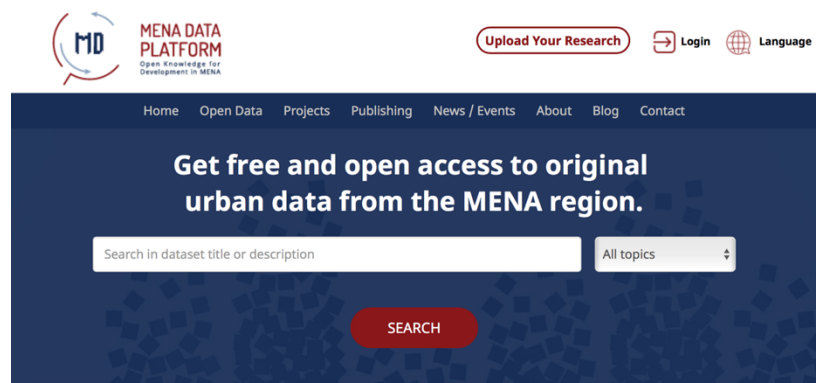

Figure 25: MENA Data Platform Landing Page

6. RECOMMENDATIONS

Over the course of the project, ODMENA has - alongside its partners across the region - undertaken a number of projects and initiatives spanning the aforementioned themes. Within the Data Skills theme, the Impact Data Lab workshop was organized and carried out by the node's partner, Visualizing Impact. The workshops looked to provide training on education, gender, and digital rights in Palestine. Further to this, the ODMENA also coordinated and organized a data literacy camp for young women in the region. The aim was to provide these women with an introduction into the field of open data and technology.

Experience over the previous two-years have led to the development of recommendations for open data for development initiatives and activities in MENA in the future. Four specific recommendations have been identified:

1. **A nuanced-approach to bottom-up capacity building:**

It is clear that the region requires a critical mass of data professionals, who are not only data literate but also able to produce and use data creatively towards development. In aiming to harness data for development it is not only important to develop technical skills, but also develop skills to understand and address social challenges. Moving forward, there should to be a more nuanced understanding of what capacities need to be built in the region.

Certain technical capabilities are available in the region, with high rates of data literacy for those educated in STEM. Data literacy remains an issue for those educated in other fields, or outside higher-education. There is need to carry out a gap analysis of skills available, and a resource analysis. Actors like private sector, journalists, and civil society need to be involved in the early inception phase. More so, long-term capacity building will only be effective if bottom-up approaches are adopted. Therefore, by beginning with the aforementioned stakeholders, assessing and understanding their needs can capacity building truly take on a sustainable turn.

It is important to bear in mind however that a key challenge for the region is assessment, as there is no unified approach and framework to assess levels of capacity before beginning to approach stakeholders and initiating projects.

2. **Monitoring Impact and Sharing Resources:**

The ODMENA project over the past two years has looked to offer support and resources to the open data community in the MENA. Data-driven initiatives have developed in the region, with activities from a multitude of stakeholders remaining an important part of the data ecosystem in the region. However, there is a need to further document these initiatives and to map out progress towards open data in the

region. This will allow ODMENA to draw on resources and knowledge produced in the open data field and avoid duplication of future initiatives.

A critical next step would be to map out resources, strengths, and gaps in the MENA Data Community, exploring new partnerships to fill-in any gaps in our community. This will allow future work to make best use of already accumulated knowledge on open data in MENA. This includes information about consultants, practitioners and other individuals who have been involved in the data for development community. The MENA Data Platform is a key initiative by A2K4D to encourage knowledge mobilization, and future efforts should focus on furthering the reach and scope of the platform.

Monitoring impact remains to be another milestone to be achieved by the ODMENA. As mapping efforts continue to expand and become more detailed, monitoring of progress also becomes more feasible and potentially more systematic and reliable. Using appropriate monitoring tools will only better inform the quality of research being undertaken, connecting it more soundly with the socio-economic needs of the groups it is targeting.

3. Engaging with data users and re-use of open data:

Moving forward, the ODMENA should further engage data users to encourage the development of demand driven initiatives. Serious consideration of the needs and constraints of the ultimate beneficiaries of ODMENA work provides purpose to future work that will be undertaken by the node. Part of the work of the node has been to broaden the data community in the region, scaling for effective use and looking to create a multidisciplinary group of partners. Considering the user as an extension of this community is a part of encouraging long-term stakeholder involvement in open data.

One example of this is the online seminars that were held by the node as part of its work on gender. These webinars brought together stakeholders - both from the data community and the development community - to discuss open data and gender and provide useful information and support on the ways to effectively incorporate gender sensitivity into data initiatives. Community-based initiatives such as these should continue into future ODMENA activities.

The uptake and re-use of generated open data from the region continues to be a key priority in furthering and continuing the work of ODMENA. Multiple use of open data is a main goal of the node and the creation of the MENA Data platform is mainly geared towards this end. The platform is intended to contribute to the creation and recycling of open data from a number of different actors in the region, to be re-used and regenerated by different users working in different fields.

4. A focus on data for development:

A part of becoming more demand-driven is a critical examination of the open by default paradigm. If the user is at the heart of initiatives, outcomes should balance openness and the need for privacy. In the

past period, A2K4D worked on the development of an ODMP for the MENA region, which takes into account local data practices and challenges. The ODMP-MENA will be used as a guideline for assessing common practices and standards in the region. The motive behind this was to focus on practices that would foster responsible open data, and to consider how communities are affected by open data initiatives. This strand of research should be taken forward, focusing on the ultimate goal of development alongside openness.

Annex 1

Reflections on Incorporating Gender in the Open Data for Development MENA Node
by
Dr. Reem Wael

I.   **Introduction**

The Open Data for Development (OD4D) MENA node includes a variety of different projects, but a gender component was necessary in all of them. The topics ranged from pollution, visualizing statistics for public awareness, health research, online media, and a research study with Syrian refugee women in Jordan and Lebanon.

The idea of incorporating a gender component in the project arose, and the introduction of a gender consultant to the project happened at a later stage. This meant that projects were at different phases of implementation and therefore, their ability and the possibility to change a component in the research differed among the projects.

II.   **Procedure**

With the A2K4D team, the gender consultant was introduced to representatives of each project individually, after reading their project briefs. They discussed some possibilities in these meetings. Based on this, the gender consultant suggested some changes/adjustments that were in line with the research phase that each project had reached.

III.   **Differences in Scope and Readiness of Projects**

As expected, with some projects, the gender component was quite clear in contrast to other projects. At the same time, the willingness of the teams to alter research scope and strategy varied.

The clearest and most evident project that lacked a necessary gender component is the health research in Lebanon, conducted by AUB. Health is one of the issues with gender at its core, as women's needs are quite different than men's. In this sense, it was essential for the team to make this gender distinction in the design phase of the project (we were using gender in a binary manner for these projects as the very first and necessary step). Unfortunately, a gender component was completely absent from the start, and therefore it was difficult to make significant changes at that point. This situation highlighted the importance of incorporating gender in the project design and the research question. The team however was one of the most resistant to any changes to the original plan. After the meeting with the A2K4D team, the project team was more open to making some minor changes suggested by the consultant.

The other project in which gender occupied a major part is the Web Radar project. In this case, gender was at the center of the project, but the understanding and idea of gender was not articulated accurately. The project used key words to categorize news covering gender in the Maghreb region into positive, negative, and neutral. There were some problems with these key words and in the method of analysis. The project team was however receptive to the idea of changes and have made some changes to the report in the right direction.

Visualizing Impact team did not engage in active research, but they used readily available data to visualize it and make it accessible and appealing to the public. The team was aware of gender issues and have expressed some difficulty in finding reliable gender data. They had already planned to include gender in their workshop as a theme. This was the project that

needed the least intervention and advice among the node projects; however, this was because the staff on the project were originally knowledgeable of and familiar with gender issues.

SETS Egypt is an engineering company, and their contribution to the node included some research on pollution levels and trends in Egypt. The team was quite open for suggestions because, given their discipline, they were not familiar with gender issues. The consultant made a few comments about limitations of the project; however, it was too late to change the scope of research for this stage of research. They included the limitations in the report, and hopefully, they will be accounted for in the future.

The refugee project in Lebanon and Jordan was essentially focused on women. The research was also conducted by the gender consultant and therefore was originally planned in a woman centric approach.

IV.   **Assessment of the Intervention**

Although it did not lead to significant changes in the content of the research conducted by the partners, this exercise was quite useful for several reasons. First, it offered new perspectives to broaden the scope of investigation to the organizations involved. Second, it reflected the importance of considering gender at an earlier stage of research – this can be employed in the next phase of the OD4D MENA node. Third, it helped the project partners identify an important limitation of their research, whether this limitation was internal or external.

For the future, it would definitely be more beneficial to include gender at an earlier stage, preferably during the design of the project. A2K4D may also put it in the guidelines in the call for proposals, framed as "explain if/how gender is related to the topic of research".

It truly helps the consultant if the projects are open to changes and discussions on gender. In this OD4D group of partners, SETS and the WebRadar project were the most promising in terms of changes. In other words, if the gender conversation was done in the beginning of the project, these two projects may have shaped out quite differently. This is mainly because of the willingness of the project managers and the openness to change scope.

Annex 2

Gender and Data Online Seminars: An Overview

Webinar 1: An Introduction to Gender and Research

February 25, 2018

Objectives:

- Initiate a discussion around the need for gender sensitive data and research in the MENA region.
- Engage with multiple stakeholders interested in the topic and introduce the network.
- Frame the 'gender in research' discourse.
- Share the experiences of multiple stakeholders in the region.

Structure:

- Introduction to the initiative, introducing participants and outlining the agenda.
- Framing gender and power differences and their implications in research and data collection.
- How do we trigger the interest and increase the awareness of research institutes and researchers to address gender, in a meaningful way?
- Reflections, suggestions for upcoming webinars and closing.

Webinar 2: Methodologies

May 8, 2018

Objectives:

- Explore the methodological problems associated with gender in research in the MENA region, both qualitative and quantitative.
- Raise meaningful ways in which we can mainstream gender into research design and structure.
- Discuss different methodologies, opportunities and challenges in implementing gender sensitive methodologies.

Structure:

- Investigating the problem: Is social science research in the MENA region currently gender sensitive? Why? Is this problem more prevalent in some disciplines over others? Is it different between quantitative and qualitative research?
- Reframing research design and research questions: How can we adapt or re-think about research structure to better capture the fluidity and complexity of gender issues? Does disaggregated data allow us to capture gendered differences or do we need to invest in longitudinal studies that measure the shifts in power dynamics between men and women over time?
- Data collection methods: What are the gender-related challenges in the data collection phase? Discuss issues like: Are female respondents accessible to data collectors? Are there any social barriers preventing women and girls from participating in data collection? Can digital tools facilitate communication with females and guarantee their participation? What are the risks faced by female participants engaging in sensitive research? Are security and privacy issues of concern for women?

Webinar 3: The Value of Data for Policymakers & the Public

September 10, 2018

Objectives:

- Pinpoint the value of data-generation for policy-makers and for the general public.
- Assess the extent to which gender policy in the MENA is based on accurate data.
- Identify barriers to gender inequalities in access to data.
- Evaluate 'open data' as a tool to reduce gender equalities to access data.

Structure:

- Data and policy-making: Are gender policies in the region relevant to women's lived realities? What are the shortcomings and challenges of the missing link between data and policy in relation to gender?
- Gendered access to data: Are there any gender differences in access to data? Why is it important for women to have access to data? What are the barriers to women's access to data?
- Open data: Is open data the solution for closing the gender gap in access to data?
- Reflections and future steps.