

Resilient Cities in the Gulf Cooperation Council

About KAPSARC

The King Abdullah Petroleum Studies and Research Center (KAPSARC) is a non-profit global institution dedicated to independent research into energy economics, policy, technology and the environment across all types of energy. KAPSARC's mandate is to advance the understanding of energy challenges and opportunities facing the world today and tomorrow, through unbiased, independent, and high-caliber research for the benefit of society. KAPSARC is located in Riyadh, Saudi Arabia.

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Key Points

What are the ways that leaders can reduce risk and build resilient cities in the Gulf Cooperation Council (GCC)? KAPSARC hosted a web-based workshop on July 20, 2020, to address this topic. The following are the main insights from the event:

Governmental entities have primary responsibility for risk identification and first response, but many stakeholders can influence the creation of sound public policies to build resilient cities. International organizations, academia, and national labs are vital partners to government leads.

National risk assessments are one component of building resilient cities, but reinforcing a culture of awareness, prevention and preparedness is a crucial component of a holistic resiliency approach. Reducing risk requires the 'owner' of the infrastructure to craft risk reduction plans so that government leads can build overarching national policies and procedures. Meanwhile, communities must build capacity to reduce risk and increase preparedness at the local level.

Federally funded research centers can help senior leaders think about structural investments. Research organizations identify high-likelihood, high-impact risks and develop cost-benefit scenarios to target funds for prevention. National labs and research centers can help the government leads understand human responses in times of crisis and, similarly, help leaders visualize where risk reduction investment will provide the greatest benefit to the community.

International organizations have provided thought leadership on resilient cities, and the United Nations' Sustainable Development Goals (SDGs) are a foundation from which national leaders can build out risk reduction programs. International organizations can provide technical assistance and work at national, regional and municipal levels to help tailor risk reduction strategies to address identified risks at all levels.

Academics help leaders take a multidisciplinary approach to adaptive capacity. One key discipline is architecture, which allows communities to consider historical approaches to urban development to overcome environmental challenges. Building new neighborhoods in areas of high heat and scarce water is a challenge that leaders in Saudi Arabia took on to create the Diplomatic Quarter in Riyadh. This case study provides insights for GCC policymakers during the present era of rapid urbanization in the region.

Summary

K APSARC hosted a webinar, “Resilient Cities in the Gulf Cooperation Council,” on July 20, 2020, to discuss the relationships between governmental leads and non-governmental capabilities to support risk mitigation policy formulation. The webinar drew global participants from diverse sectors and included representation from the private sector, the research community, international organizations, and governmental leaders.

The discussions focused on building capacity to deal with challenges such as climate change and global pandemics. The webinar featured the perspectives of the Saudi Arabian National Risk

Unit and their mandate to conduct national-level risk reduction initiatives, while simultaneously working with national, regional and municipal leaders to create a culture of risk awareness. With this introduction in place, participants learned about the governmental lead-decision support relationship used in the United States and how this relationship has proven effective for over seven decades. An overview of the role of the United Nations Development Program provided insights into how international organizations create policy frameworks that can help national leaders frame risk reduction programs. Finally, the role of academics was profiled, with ideas on how historical case studies can inform future infrastructure approaches.

Background to the Workshop

The topic of resiliency has become very popular globally over the last few years, but what does it mean for urban areas in the Gulf Cooperation Council? To answer this question, KAPSARC hosted a webinar on July 20, 2020, to bring together thought leaders to discuss the topic and share best practices at a strategic level, using a historical case study.

While the term ‘resiliency’ has become quite popular in the last few years across many disciplines, pinning down a singular definition is a bit of a challenge due to the multidisciplinary nature of the topic. The fields of engineering, ecology, economics, psychology, and, most recently, political science include discussions of resiliency.

The United Nations Office for Disaster Risk Reduction has a well-accepted definition for the concept. Its terms of reference use the following framing language for resiliency: “The ability of a system, community or society exposed to hazards to resist, absorb, accommodate, adapt to, transform and recover from the effects of a hazard in a timely and efficient manner, including through the preservation and restoration of its essential basic structures and functions through risk management.” (U N n.d.) Sustainable Development Goal 9 incorporates similar language: “Build resilient infrastructure, promote inclusive and sustainable industrialization, and foster innovation.” (UNDRR n.d.)

Creating resilient cities that can withstand global challenges must be done with intention, but it cannot be solely on the shoulders of government agencies. Instead, it requires a unity of effort between governmental and non-governmental entities. Many stakeholders have a role in promoting resilient cities, including sponsored labs, international organizations, and academics. Optimally, these entities can help shape the policies and procedures at national and regional levels to reduce exposure to hazards and build a culture of risk reduction down to the community level.

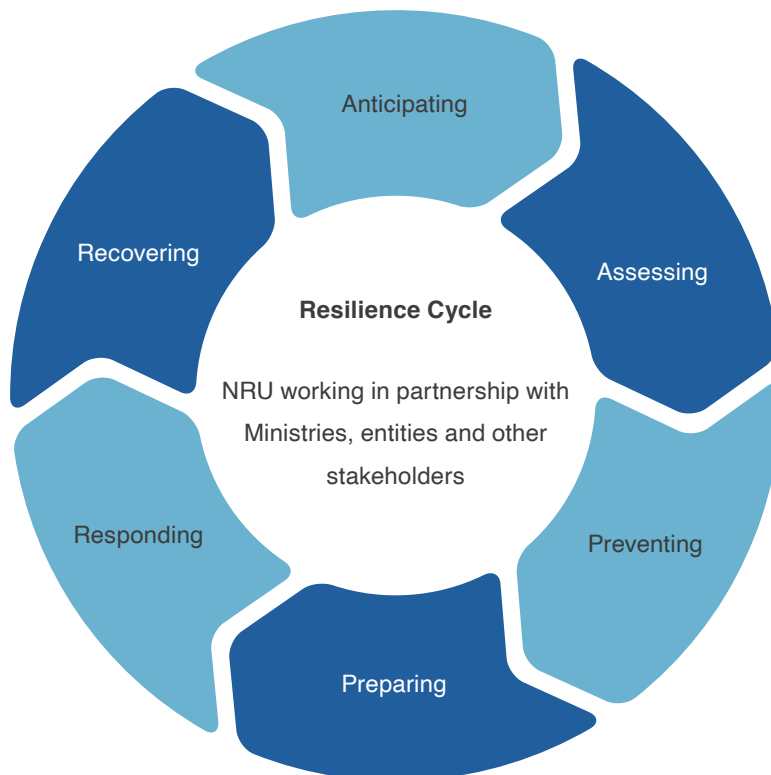
Governmental Lead: Saudi Arabian National Risk Unit

The webinar featured a presentation from the Saudi Arabian National Risk Unit (NRU), with overarching information on the organizational mandate of and the challenges and opportunities for this newly established government entity. The NRU's mission is to develop and improve the Kingdom's resilience to emergencies of all kinds. In less than three years of its existence, this entity has had the challenge of building its internal capacity, while simultaneously working with diverse national stakeholders to better understand national-level risks facing the Kingdom.

The NRU's tasks include developing a comprehensive national risk assessment and a critical infrastructure register, increasing the country's preparedness for risks, and establishing governmental centers to manage emergencies.

The NRU uses a continuum to demonstrate its approach to resiliency (Figure 1).

Figure 1. The NRU's 'resilience cycle'.



Source: NRU presentation, July 2020.

While a resilience cycle helps frame the issue, the overarching question that risk professionals must address is how to create a national strategy while working to reduce risk at the local level. There is a need for a national approach, but how can ‘top-down’ strategies be harmonized to reflect local realities? The NRU approach incorporates both national risk assessments while also focusing on capacity building at the regional, local, and city levels. The NRU’s work on the National Risk Assessment (NRA) and the National Summer/Winter Seasonal Risk Assessment (SSRA and WSRA) provides a strategic understanding of the main national risks for Saudi Arabia, and the subsequent impacts of these on the NRA’s capabilities in the short term (six months) and medium term (five years). The national impact planning assumptions can be determined from the risk assessments, which can then be used to identify the capabilities required to mitigate the impacts of these identified risks.

Risk practitioners highlight that investments in resilient infrastructure tend to be wise, and investments in crisis prevention can save money and lives in the event of a disaster. Investments in risk reduction and resiliency tend to be money well spent. For each dollar invested in building resiliency, four dollars are saved in subsequent relief and reconstruction costs after an emergency. Creating a consolidated risk assessment is the first step in determining where to best target funding to create the maximum benefit. The NRU’s conceptual framework can help the Saudi authorities make the most optimal risk reduction investments.

The NRU has drawn on best practices and international frameworks to inform its overarching policy and procedures. The NRU incorporates doctrine from the United Nations Disaster Risk Reduction strategy and the United Nations Development Program’s (UNDP’s) Sustainable Development Goals (SDGs) to help frame domestic approaches. The UNDP’s risk reduction and sustainable development frameworks serve as the foundation for identifying areas of investment in a country with rapid urbanization. The NRU’s flexibility to incorporate international policy approaches, combined with rigorous national risk assessments, can help it to both mitigate near-term national challenges and reduce longer-term risks.

National Research Centers: Argonne National Laboratory

Federally funded research centers such as the Argonne National Laboratory can help senior leaders think strategically about making structural investments. Research organizations identify high-likelihood, high-impact disasters, and develop cost-benefit projections to help government leaders determine where to invest in critical infrastructure. In addition to infrastructure modeling, national labs and research centers can help policymakers understand human responses in times of crisis and, similarly, help leaders visualize where risk reduction investments will provide the highest benefit for communities.

Balancing out how to divide funding for structural investments, such as levees or building sea walls, or non-structural investments such as early warning information systems, can be daunting. Communities have an incentive to invest in crisis prevention rather than pay for relief and reconstruction, but determining precisely where to direct critical funding is a bit more complicated.

Government-sponsored laboratories play a role in developing methods, models, and tools to help stakeholders determine where to make critical infrastructure investments. The webinar featured the work of Argonne National Laboratory (Argonne) and their support for resiliency studies. Argonne was founded over 75 years ago with the mission to help find peaceful uses for nuclear power. It is one of seventeen U.S. Department of Energy National Laboratories. The webinar provided the opportunity to describe Argonne's decision support tools and the role that the lab plays domestically and internationally to promote resiliency.

A brief overview of three energy system resiliency models was given. The focus then shifted to decision support tools it has developed to support senior

leaders in the wake of the COVID-19 pandemic. As an example, a tool was developed to enable planners to identify which members of the workforce in any county in the U.S. were essential workers and could therefore be vulnerable to the COVID-19 virus. In DuPage County, Illinois, where Argonne is located, 59% of its workforce is employed in essential industries, and 15% of the workers are employed in high-risk industries. At Argonne, senior leaders are able to identify risk areas for their researchers and gain insights into how the overall community surrounding the laboratory facilities would fare during the pandemic. For example, senior leaders in the greater Chicago area were given a summary of residents' access to hospitals, pharmacies, and grocery stores. The research revealed segments of urban areas that lack critical access to care and essential supplies.

The Argonne team was also able to layer workforce and infrastructure data to provide context for senior leaders to understand the implications of areas where access to food and healthcare is lacking, and how this lack of access is linked to vulnerable populations.

In the wake of the virus, the Argonne Decision and Infrastructure Science team has produced risk mapping, while other groups have a direct role in laboratory-based research on the virus itself. Their focus has been learning about the COVID-19 protein structure to lay the groundwork for potential drug therapies and vaccines.

In sum, senior leaders often know that investments in crisis mitigation are needed, but they may not have the tools to make sound decisions about where to start on such a formidable task. Multidisciplinary laboratories such as Argonne serve a crucial role in helping senior leaders decide where to invest in resiliency to benefit their entire community.

International Organizations: United Nations Development Program

International organizations such as the UNDP have been at the forefront of the resilient cities movement. The UNDP's work on risk reduction incorporates multiple international covenants, including the Sendai Framework and the Addis Ababa Action Agenda, the Sustainable Development Goals and Agenda 2030, the Paris Agreement, the World Humanitarian Summit Commitments to Action and the New Urban Agenda (Habitat III).

The UNDP has representation in 170 countries, and this global reach allows for risk practitioners to work at national, municipal, and community levels. The UNDP looks at the full spectrum of risk in urban areas, due in part to the fact that 60%-85% of the world's population lives in cities, and systemic challenges such as climate change, migration and inequality degrade the quality of life around the globe.

While national leadership is critical, international organizations play crucial roles at the city level in identifying challenges and finding opportunities for participative approaches to increasing access to essential services such as water and electricity. The UNDP can work at a strategic level and has strengths in working on risk reduction initiatives at the city level. It also has the ability to build partnerships across borders. UN agreements have been adopted around the globe and incorporated into some of the NRU's approaches, allowing domestic leaders to have a starting point for policy formulation.

The UNDP can serve as a knowledge resource and help communities in the GCC tailor risk reduction programs to the unique conditions of their urban areas. Specific UNDP strengths include partnering with national and city-level leaders to provide technical assistance, helping to mainstream resilience programs, and hosting events such as the Resilient Cities Forum.

A key strength of international organizations such as the UNDP is their ability to bring thought leadership that helps influence the long-term impacts of decisions. Long-term thinking helps policymakers understand some of the historical realities that may have led to heightened risk. It also helps policymakers explore technological solutions for building resiliency. This approach does not just address infrastructure resilience; it also focuses on behavioral change rooted in the social sciences, and the UNDP's long-term engagement with communities.

Academia: Comprehensive Thinking on Resilient Cities

Universities and academics play a critical role in helping to provide analytical thinking on the topic of resilient cities. Many different disciplines address resiliency, but there is no shared definition of the concept among the scientific community. From an architectural perspective, the built environment should be resilient to environmental stress, but buildings should also provide inspiration beyond just shelter. While government leads must harmonize policy and focus on current challenges, academics can support this process through cross-disciplinary comprehensive

thinking, by borrowing architectural styles from the past and incorporating scientific advances from modern times. The webinar provided the opportunity to explore the approaches architects take in creating built environments, and featured a case study of the history of the complex development of Riyadh's Diplomatic Quarter.

The webinar included risk practitioners from around the globe who have never visited Saudi Arabia. Many foreigners may think of vast sand dunes when envisioning the environment in Saudi Arabia.

Figure 2. Sand dunes in Saudi Arabia.



Source: Shutterstock.

Figure 3. Rocky terrain poses challenges for urban development.



Source: Shutterstock.

In reality, much of the terrain in Riyadh resembles a rocky plateau.

The resilience challenges of the Diplomatic Quarter in Riyadh were presented by its stony site, the city's extreme weather conditions, and the absence of water. A long-term vision for the site, supported by technical and management know-how, made it a role model and a trend-setter in urban transformation management and architecture.

Planners and architects can help to broaden perspectives on resiliency and can help communities to look at historical examples of best practices to reduce risk. They can also help ensure that the built space acknowledges environmental challenges in an era of climate change. The Diplomatic Quarter in Riyadh serves as a great case study on merging the 'old' style of adaptive architecture with innovative new approaches to

create sought-after centers for work and living.

It took decades for city planners to acknowledge the importance of walkable cities for both overall wellness and protecting the environment. The leaders of the Diplomatic Quarter design were able to create a walkable city where residents can live within close distance to work and take advantage of the environmentally friendly designed urban and natural habitat for shaded walk and exercise.

In sum, the Diplomatic Quarter provides today's leaders with a reminder of the complexity of building in austere environments, and the importance of incorporating a design that best adapts to environmental challenges while highlighting the natural beauty of an area. This case study can provide lessons for developers undertaking ambitious new projects in the region.

Conclusion: Prevention is Better Than a Cure

There are many proverbs that highlight the importance of investing in risk reduction. In English, a well-known proverb is “A stitch in time will save nine” – i.e., repairing something prevents further damage. A parallel in the Arabic-speaking world might be “Prevention is better than a cure.” There is a growing understanding of the need to invest in resiliency. Stakeholders such as research labs, international organizations, and academics can help government leaders make the most valuable investments to this end.

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About the Workshop

This webinar took place in Riyadh on July 20, 2020. It brought together governmental and non-governmental stakeholders to discuss key issues relating to reducing risk and promoting resiliency in cities in Gulf Cooperation Council countries. The first webinar highlighted the governmental roles of the Saudi Arabian National Risk Unit and presented a case study of Riyadh's Diplomatic Quarter. Research roles within the United Nations, the Argonne National Laboratory and academia were highlighted as key to providing insights to help stakeholders in their efforts to reduce risk and promote resilient cities.

List of participants

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Sara Lechtenberg-Kasten is a research fellow in the Transport and Urban Infrastructure program. She joined KAPSARC in 2015, bringing extensive experience in designing politically sensitive studies for governmental and non-governmental organizations. Sara has worked at strategic, operational and tactical levels to design and manage studies on organizational change. She has also led multidisciplinary teams and worked with clients worldwide, with experiences in Saudi Arabia, Haiti, El Salvador, Kuwait, Nigeria, Thailand, and South Africa.

About the Project

What makes a city resilient? There is a growing community of risk and resiliency professionals working to determine the best approaches to building communities that can adapt to global challenges. This project explores the concept of Resilient Cities and investigates how this applies to communities in the Gulf Cooperation Council (GCC). The research provides insights into how stakeholders can reduce risk and build cities that can adapt to global challenges. KAPSARC hosted a webinar on July 20, 2020, Resilient Cities, From the Perspective of the Gulf Cooperation Community, to bring together thought leaders from government, academia and policy centers to discuss the topic. The workshop profiled the research of KAPSARC's Resilient Cities project and highlighted multidisciplinary approaches to identifying risks and building strategic and community-based options to reduce threats in urban areas.



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