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## Middle Eastern Cities in a Time of Climate Crisis

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## Heat Island Effects and Cities

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## HEAT ISLAND EFFECTS AND CITIES

I'll be talking about the heat island effect (HIE) and the impact it has and how this is related to climate change but also what we can do to address this.<sup>1</sup> When I was on my way over here today, I saw something interesting. I saw a bird gliding, not fluttering its wings, but gliding for about two or three minutes as we moved along, and it was completely stationary while it was moving. And as someone who was going to talk about the HIE, I was aware of what was happening. This bird was moving over convection currents. Essentially, the sun hits the ground – the jungle of asphalt, the jungle of concrete – and this city is emitting it back and radiating a lot of this heat. This is also creating convection currents, which provide lift for something like a bird that you would see not moving its wings. Gliding is also a hobby, where you can glide for hours with an almost race plane. This is always a very interesting thing to reflect on because as much as something like this is fascinating, it's also telling us a lot about a very serious problem that we are facing today.

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1 This contribution is transcribed from an oral intervention at the *Facing climate change* conference.

In a nutshell, HIEs occur when you have when a city that is losing its vegetative cover. And what is it being replaced with? Non-permeable, non-pervious surfaces – asphalt and concrete and so on. Research has proven that this is associated with increased cases of deteriorating cardiovascular diseases, respiratory diseases and many other illnesses. So the next question is, why is this related to climate change? As we all know, climate change has a lot of impacts. But what if there are further impacts or further phenomena that exacerbate things or make them worse? As we learned before in the previous panel,<sup>2</sup> for example, when we talk about sea level rise, there's also something people are doing today that only make things worse, such as excessive extraction of groundwater or the silt that's being held back by the high dam and so on, which is further exacerbating an existing problem. And this is what we've observed in the past. So, what does the IPCC report say about what's going to happen in the future? To be concise, the extreme events that used to happen maybe once every ten years are now happening two to three times every ten years and will accelerate. So, the propensity for catastrophe is higher.

But we also have the problem that most of the population is living in cities now. As you walk around, imagine that since 2008, half of the world is living in cities, but in the next fifty years we're going to have 80 per cent of all people living in cities. This is why this is getting more and more attention. So even the researchers and leading thinkers that are working on addressing rural issues are all looking into the city. For example, the Food and Agriculture Organization (FAO) is now looking at cities as well and launching programmes like the Green Cities Initiative. Suddenly, even those who've dedicated their lives, their research, their work and their profession to the rural areas see that 80 per cent of the world is going to live in urban areas. This means that the current state of affairs cannot be sustainable. It's not just climate change that would impact us; it's also the way we're going to design our cities. What we have now happening around the world is a quick response by solving the problem itself or breaking down the problem and solving each issue. For instance, how would you address

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2 On metropolises, fragile deltas and vulnerable territories.

the HIE in cities? The answer might be partly through recovery of surface vegetation, a sort of urban nature. But we're not just talking about the surface, the streets or the spaces between buildings but also about rooftops. This is a concept that's spreading like wildfire now around the world, in many cities. It turns out that the more attention you give to the materials you use on your surfaces, the better your city will cope with this phenomenon.

Then some new concept starts emerging, such as heat equity. As you can imagine, this is related to the unjust distribution of the impact of HIEs. This is another issue that cities are now racing to address, such as having special programmes dedicated to vulnerable groups of society that would be most affected not just by climate change but by what we have done to our cities to accelerate or magnify this challenge. Let me move on to the projects that are being done, focusing for the sake of time on one sector as an example. This is a sector that we're working with a lot in UN-Habitat – sustainable mobility. The question is, what is the relation between sustainable mobility and the HIE? Take a walk after this event. You'll see that the spaces between buildings are now becoming entirely asphalt and sidewalks. There's very little green space. We are losing space to private cars; about 200,000 cars are hitting the roads every year in Egypt. We're losing about four football fields worth of space every week in Cairo, as an example. This is space that should rather be dedicated to spaces for children to play in parks and other services in the city or just spaces in the city for people to enjoy the urban experience. This is what we're seeing every day, and we see this in all cities around the world.

We heard a little bit about Jakarta and the challenges it's having with the rise in sea level, but Jakarta itself as a mega city, or Manila or Mexico City – they're facing similar problems, accelerated loss of public space, but not just to the favour of cars but to the favour of asphalt and concrete. We've been designing our cities for a while, so among the solutions is to mitigate this problem through improving our provision of alternative modes of transport. This is exactly what we're doing as we advocate projects such as the promotion of cycling and its different forms and bike sharing and so on to diversify the solutions. This is not trying to diversify the solutions of mobility but rather to enable people to move from their cars to a diversified lifestyle

of mobility. Here we see hope in reducing our need for asphalt and for the jungle of roads and bridges. We've been starting to see it in many cities and towns. The key takeaway here is that if we start looking at each sector, we're going to find a lot of solutions. Mobility is probably among the most prominent areas where we can address this issue, which is very much related to climate change and its impact on the unjust distribution of its impact.

As we move forward, we can also start addressing new challenges that are coming on our agenda. If you look at the conflicts that are happening now and in Europe, everybody is talking about this. If it had not been for the preparation over the past couple of decades to have resilient cities, there would have been much more significant problems like food shortages, among other things. More than ten years ago, I was actually involved in an upgrade project in some of the biggest power plants in Poland, Turkey and Iraq. These were coal power plants. As I see how things are unfolding now, I am realizing how much impact something that was done so many years in advance has had in building a resilient city. Back then, it was for climate change, not for an energy crisis.

At the end of the day, resilience is the same thing as it is to show how this activity undertaken more than ten, fifteen years ago is today really serving resilience in the current energy crisis. The provision of district heating in the city is possible because the power plants there were to a very large extent catering to heating at the city level. Here I'm venturing into another sector, which is the power sector – heating and cooling and so on. As we look at all the different sectors and at building a resilient city, we are not only building resilience for climate change and heat islands but also for any further crisis that we might face in the future. If we rewind again and look at the key messages that we are advocating, it is ensuring that the future is one that is less dependent on private cars in fewer cities that are in less need of more and bigger roads and bridges. We want to ensure solutions, such as green roofs, that can create a lot of green jobs and diversity the urban nature to cater to the biodiversity that lives with us in the city. It's not just human beings but all the diverse species that we need to take care of.