



BEYOND TREES

IMPROVING LIVES FROM BLACKTOPS TO TREETOPS TO ROOFTOPS



URBAN FORESTRY AND FARMING IN THE MIDDLE EAST



BEYOND TREES

AUGUST 2020

INTRODUCTION TO URBAN FORESTRY AND FARMING IN THE MIDDLE EAST

Welcome to Beyond Trees. This special issue of the newsletter is dedicated to urban forestry and farming in the Middle East and North Africa. Organized and facilitated by the U.S. Forest Service International Programs in January 2020, the Middle East and North Africa (MENA) Green Cities Study Tour inspired this issue. It presents some of the efforts non-governmental organizations (NGOs), universities and community leaders in Egypt, Tunisia, Lebanon, Palestine and Jordan are taking to add green spaces to cities in the MENA region.

This issue takes a closer look at the challenges that the region's climate, the particularities that cityscape and the built environment, and resource scarcity pose for planting in cities. It also presents examples of community cohesion and resilience, of leadership and the engagement of women, youth and children, as well as the design of technical solutions tailored specifically to this region's needs. This Beyond Trees newsletter contains articles on urban forestry growing techniques, rooftop gardening initiatives, food production in cities, composting on city roofs, and the development of youth environmental awareness and stewardship through art, as well as activities aimed at raising awareness and engaging the community in greening their cities across the MENA region.

As a global pandemic has forced large parts of the world's population into lockdown measures of geographic confinement and social distancing this year, the availability of green spaces in cities has taken on an even more special and prominent meaning. Liza Paqueo, Urban Outreach and Partnership Specialist with the U.S. Forest Service International Programs, shares some thoughts on this issue.

This issue of Beyond Trees is dedicated to initiatives taken in different countries of the Middle East to increase urban greenspace and promote urban farming and gardening. **What role does urban farming and rooftop gardening play in our cities - specifically at a time when large parts of the world have to deal with lockdown restrictions to their daily lives?**

Liza: Urban farms—especially rooftop and backyard gardens—provide many benefits during a lockdown. The most obvious one is that it can be an immediate food source for families. That depends on the type and the amount of crops being grown. What is just as critical is the role these urban spaces play on one's mental, physical, and spiritual well-being. Urban gardens and farms can help provide comfort and connection to nature. In addition, these urban green spaces may also serve as habitats and food sources for birds, butterflies, bees and other wildlife.

This Beyond Trees issue was inspired by the work of participants who took part in the Regional Study Tour on Urban Forestry and Green Landscapes in Urban Environments held in Cairo in early 2020. **What role can regional and international workshops and study tours play in advancing urban forestry, farming and gardening in different regions of the world?**



Liza: Workshops and study tours that convene colleagues and practitioners from other countries can help facilitate the exchange of information—current research and efforts, innovative techniques and methods, and challenges. They can help connect people to each other and allow for further dialogue beyond the scope and dates of the workshops.

How does rooftop gardening and urban farming feature among the range of activities the U.S. Forest Service’s International Programs offers?

Liza: One does not normally associate the U.S. Forest Service and/or urban forestry with rooftop gardening and urban farming. The U.S. Forest Service International Programs, however, works to improve lives in both rural and urban areas by engaging the communities. Urban farms and rooftop gardens can help improve lives in so many ways. These are green spaces—like parks, urban forests, etc. -- that should be explored as critical to that mission.



About Liza Paqueo :

Liza Paqueo is an Urban Outreach and Partnership Specialist with the U.S. Forest Service International Programs. She works in several cities overseas on community engagement and urban forest program activities. She also manages a network of urban organizations through Beyond Trees. She is one of the coordinators of the International Seminar on Urban Forestry and Community Engagement and has led the US delegation to the World Forum on Urban Forestry. She has also been a member of the North American Forest Commission, which is a collaborative group of natural resource practitioners across Canada, US and Mexico.

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GREEN CITY INITIATIVES IN THE MIDDLE EAST AND NORTH AFRICA

BY: TINA JASKOLSKI

The Middle East and North Africa (MENA) Green Cities Study Tour inspired this special issue of Beyond Trees. In January 2020, the U.S. Forest Service (USFS) brought together a group of individuals from Egypt, Lebanon, Jordan, Tunisia, and Palestine to Cairo, Egypt. The study tour's goal was to highlight urban environmental initiatives in Egypt and to generate ideas and inspiration for how to expand and enhance urban programs in the participants' home countries. A group of participants of the Forest Service's [International Seminar on Urban Forestry and Community Engagement](#), which takes place annually in Chicago and New York City, originally envisaged the regional study tour. Tina Jaskolski from Egypt and Julia Hani from Lebanon (seminar alumna from 2019) were brainstorming together in sunny Prospect Park, New York, when they realized how much they could learn through a regional exchange on urban programs. Abdallah Tawfic (seminar alumnus from 2018 and an urban farming entrepreneur in Egypt) also played an active role in hosting the Green Cities Study Tour in Cairo.

Tina Jaskolski explains American University of Cairo's hydroponics trial (left), Julia Hani and Tina point at the Giza pyramids in the distance (middle), and Abdallah Tawfic (right) explains the technical details of a rooftop garden in Cairo.



When it comes to urban forestry and agriculture, the MENA region faces a very special set of challenges. When filling in their applications for the seminar, Abdallah and Tina, who both represented Egypt, were asked to provide an example of forestry in their own countries. Abdallah laughs, "I did not know what to write; our country doesn't have any forests."

Large parts of the MENA region see scarce rainfall. While Egypt's coast gets around 200mm of rainfall per year, the figure drops to zero south of the capital city, Cairo. In Egypt, as well as in large parts of the Middle East agricultural production is impossible without irrigation. Therefore, prominent questions that guide urban forestry and agriculture initiatives in this part of the world are: "How will we water the plants?" and "How can we ensure project sustainability in the face of regional water scarcity?"

Water scarcity occurs when a country has less than 1,000 m³ of fresh water available per person per year. Egypt has around 600 m³ at present and may cross the extreme water scarcity threshold of 500 m³ by 2025¹. Jordan already faces extreme water scarcity, at under 50 m³ domestic water share per person per year², one of the lowest per capita availabilities of water on the planet³. Water supply meets only half the population's water demand, while over 50% of the country's freshwater irrigates agricultural lands⁴. Due to limited water availability, Palestine has an even lower per capita consumption of only 55 liters per person per day⁵.



1: Ministry of Water Resources and Irrigation, Egypt. 2014. *Water Scarcity in Egypt*. Accessed January 12, 2020. Ministry of Planning, Monitoring and Administrative Reform (MPAR).

2: Ministry of Water and Irrigation, Jordan. 2016. *Water Reallocation Policy*: <http://extwprlegsl.fao.org/docs/pdf/jor159136.pdf>

3: WHO. 2020: <https://www.who.int/heli/pilots/jordan/en/>

4: <https://www.usaid.gov/jordan/water-and-waste-water-infrastructure>

5: Abu Zahra. 2001: *Water Crisis in Palestine*. *Desalination*, 136(1).

Study tour participant Mohamed enjoys the Nile view from his hotel room (left) while Engineer Hassan Husseiny shows the group the gate on an irrigation canal in a small village in Egypt's Nile Delta.

Freshwater sources in the MENA region are limited. For example, Egypt is a country that depends on the Nile water for almost 99% of its fresh water needs, with 85% of water used in agricultural production. As the Nile River draws its water from countries further upstream, Egypt has an extremely high dependency on water originating outside the country (over 96%). This dependency is lower in Jordan (27.2%) and Lebanon (0.79%)⁶, both of which have access to more internal freshwater sources, including rivers, springs and aquifers⁷. Tunisia receives 53.8% of its water from surface water sources and 46.2% from groundwater aquifers. Problematically, groundwater is not necessarily a renewable resource. Several MENA countries are seeing their groundwater resources rapidly depleted. In Jordan, almost 60% of all fresh water consumed in the country comes from aquifers⁸. Users are depleting these aquifers twice as fast as nature can replenish them. Egypt, in turn, is pumping the waters of the transnational, non-renewable [Nubian Sandstone Aquifer](#).

While water resources are dwindling, rapid population growth across the MENA region means that water demand is growing. The MENA countries who participated in the study tour experience a population growth between 0.7% and 2.7%⁹, the lowest being Lebanon and the highest Palestine. In Egypt, the population of around 100 million people grows by 1 million every 6 to 10 months¹⁰. Population growth paired with economic growth means that demand for, and competition over, limited fresh water resources increases.

Food production relies on irrigation, a lack of water can have a serious impact on food security. Food security occurs where "all people, at all times, have physical and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life"¹¹. Once known as the Roman Empire's breadbasket, Egypt now imports 50% of the country's wheat consumption and has become a net food importer¹². Urbanization and the destruction of fertile agricultural land further exacerbate the problem. A total of 96% of Egypt's population lives on only 7% of the land, causing population densities of over 19,000 people per km²¹³. The lack of arable land is a general problem across the region, with MENA having access to only slightly over a third of the world's country average.

6: USAID. 2020: *Country indicators Jordan*: <https://idea.usaid.gov>

7: Bouchrika, A., Jouber, A. and Bardi, W. 2015: *The Water Management in Tunisia: A Trend towards Unconventional Resources*, *Journal of Management Research*, 7(3), 71-84.

8: Whitman, E. 2019: *A Land without Water: The Scramble to Stop Jordan from Running Dry*, *Nature*, 4 September 2019: <https://www.nature.com/articles/d41586-019-02600-w>

9: Worldometers.com

10: Central Agency for Public Mobilization and Statistics, Egypt 2020

11 Definition developed at the World Food Summit in Rome in 1996

12 World Food Programme, Egypt, 2018. In: *World Food Programme*. Rome. <https://www.wfp.org/countries/egypt>

13: World Population Review, 2019: *Cairo Population 2019*. <http://worldpopulationreview.com/world-cities/cairo-population/>.



The study tour participants spent several days in Cairo's dense areas, where many of the city's rooftop gardening initiatives are located.

Across the world, more and more people are living in cities. It is estimated that by 2050, almost 70% of the world's population might be city dwellers ¹⁴. Transporting food from rural areas to city consumers can be challenging, expensive and environmentally destructive. In the MENA region, long transportation routes can also contribute to post harvest losses and the destruction of food that was farmed with scarce water resources to begin with. Growing food in cities, close to the consumers, can mitigate problems of transportation and of lack of available arable land. However, solutions to urban farming in the MENA region have to be water efficient, while plants have to be able to withstand high summer temperatures.

The Middle East and North Africa Green Cities Study Tour gave urban foresters and farmers from across the region an opportunity to exchange thoughts and ideas about how to tackle urban greening and food production challenges in the region. The group that came together in Cairo are all working in different ways to change their cities through urban agriculture, rooftop gardens, innovative waste management solutions, and community engagement. Throughout the tour, participants had the opportunity to listen to lectures and presentations at The American University in Cairo (AUC) and to visit a range of urban greening projects, some of which AUC and USFS have helped establish.

The group visited startup companies focusing on urban agriculture, NGOs with rooftop gardens used for education and community engagement efforts as well as a newly established rooftop garden of a community leader, who has become famous as a rapper.

14: UN. 2018. 68% of the World Population Projected to Live in Urban Areas by 2050, says UN. <https://www.un.org/development/desa/en/news/population/2018-revision-of-world-urbanization-prospects.html>

Below: Study tour participants visited two rooftop gardening initiatives in Cairo.



The participants enjoyed the city's largest park, established on top of a former landfill, and met local farmers in a village in Egypt's Nile Delta, where children play in a popular community garden. The group also took a tour of Cairo's famous waste management community, the zabaleen, and explored the work of two NGOs which have established recycling and education projects in the community.

This issue of Beyond Trees shares the impact of this study tour, and showcases some of the initiatives study tour participants are pursuing in their various countries. We invite you to take a virtual tour across the Middle East and North Africa, to meet some of the community organizations and individuals who have made a difference, learn about the individual challenges each country faces, and see how activists are overcoming local challenges by working with community partners.

Below: Highly efficient urban vegetable growing at Urban Greens, using hydroponic growing techniques.

Bottom left: Sightseeing finale at the pyramids

Bottom right: Seminar participant helps one of Mish Madrasa children put on a scarf



INTERVIEW WITH KRISTINA BELL AND GRACE SWANSON, SPECIALISTS OF THE AFRICA AND MIDDLE EAST REGIONAL TEAM OF THE U.S. FOREST SERVICE INTERNATIONAL PROGRAMS



Kristina Bell



Grace Swanson

1. As organizers of the MENA Green Cities Study Tour, what were some of the main take away messages from the week?

Grace: Many people who are part of urban cultures in the MENA region shared that they had lost their knowledge and practices of the past, as it relates to engaging with nature. Especially in densely built and less fortunate neighborhoods, the urban lifestyle can cause significant indirect stress, and occupants will be more concerned with meeting basic needs than addressing environmental concerns. Urban forestry represents a luxury in these parts of the city. This is why programs that manage to address both food security and greening, through productive rooftop gardening for example, are even more important for these neighborhoods.

Kristina: In Cairo, NGOs, volunteerism and the culture of start-up business ventures play an important role in kick-starting rooftop gardening initiatives that may grow into larger movements. In Cairo, it also seems that there are many informal solutions that play an important role in building an urban gardening culture. Scientific data and the measurement of impact, which can be hard to come by, play an important role in spreading the message of the benefits of rooftop gardening. They might help with getting people to believe in change and to stay committed and engaged in a process of transformation into greener urban livelihoods.

2. What were some of the surprising elements of the tour – with regards to the projects you saw, the people you met, or the interaction of the participants?

Kristina: There are many unique, diverse and much-needed projects going on across Greater Cairo. I am very happy that I have been able to engage and assist some of these initiatives, while the US Forest Service has been able to provide the technical assistance needed with project implementation.

Grace: Despite there being some broad cross-cutting cultural similarities amongst the participants, it was interesting to observe the characteristics that make Egypt and Cairo unique. It was an exciting learning experience for those of us visiting from near and far.

3. At the end of the week, all participants presented action plans for what they thought they could do to advance urban forestry in their respective countries. How can these participants learn from each other and help each other succeed?

Kristina: As part of the presentation of action plans, we wanted the groups to offer solutions and recommendations to their colleagues, and this was great. This made the problem-solving process more engaging and seem more tangible and attainable. Also, some of these organizations are really good in areas where other people/organizations struggle, so we've encouraged those groups to connect and problem solve together.

Grace: There is a wealth of knowledge among the study tour participants, ranging from green roof technology to social media to volunteer engagement, and so many opportunities to learn from each other. It's great to be able to connect committed individuals from across the region who can collaborate and exchange with each other long after the study tour ends. We were happy to connect committed individuals from across the region who might be able to encourage each other's work in the future.

4. As part of your work at the U.S. Forest Service International Programs, you get to visit a lot of countries and projects. What is special about or specific to the Middle East that you think might be an asset in advancing urban forestry and rooftop gardening in the region?

Kristina: One asset I see is what others might see as a challenge – the lack of 'green' space, especially in urban areas. As a result of the arid climate, desert landscapes, and increasing urbanization, greening and urban nature seems oxymoronic, but, on the other hand, it gives these kinds of projects a lot of potential and visibility because they are so needed. People are desperate for green spaces to socialize, grow food, clean the air, and to look at and take pride in.

Grace: There are great organizations working on these issues in the region, and it was exciting to see so many represented in our group and during our site visits in Cairo. Everyone who joined the study tour came willing to explore new ideas, brainstorm with each other, and try something new when they returned home. We are excited to see them continue to inspire others and change their cities for the better.

5. What was your favorite dish you got to taste during the week?

Kristina: Out of a week of fancy hotel food and restaurant eating, my favorite meal was a home-cooked meal of my favorite Egyptian dish – Mahshi (stuffed peppers) in a small village outside Cairo by one of our site host's family. Delicious!

Grace: Every meal I ate was my favorite, but it was especially fun to try classic Egyptian koshari.

6. The interactions among our participants from Lebanon, Tunisia, Jordan, Palestine and Egypt sometimes required Arabic-to-Arabic translation, due to the different regional dialects. What Arabic word did you learn during the week?

Kristina: I didn't learn this word, but I used it a lot – Yalla, because we always seemed to be late :)

Grace: Most of the other words revolved around food – the second most important part of the visit!



COMMUNITY-BASED ROOFTOP GARDENING IN CAIRO, EGYPT

BY: TINA JASKOLSKI

"I am a farmer now!" laughs rapper 'Khalifa'. "This is my new rooftop oasis."

Khalifa points to his family's new rooftop garden, located in the Cairo neighborhood of Hataba, where the buildings are nestled between historic structures of Cairo's historic Islamic heritage, right at the foot of Cairo's famous Saladin Citadel. In fact, some of the houses almost physically lean against the Citadel's wall. Hataba's proximity to these famous monuments has characterized the community's livelihood for decades. However, it has also brought them several eviction threats from the Egyptian government.

Khalifa, who raps about his neighborhood's history, community, and love for its residents, seeks to protect Hataba by beautifying it.

"If we green all the rooftops here, you could see that on a satellite image or when looking down from the citadel," he says, "so when the investors come to take away our neighborhood, at least we don't look like a trash can."

Khalifa is a community leader who has become a rooftop garden champion. Such champions are much needed to spread the idea of planting on rooftops across the many neighborhoods of the vast metropolitan area of Greater Cairo.

"Perhaps my next rap song will be about rooftop gardening," Khalifa laughs.

Egypt's capital city is home to over 20 million people. Its urban form contains extremely dense construction with very limited open areas and green spaces. Cairo's residents are used to living in crowded areas. In fact, some of Cairo's neighborhoods belong to the most densely populated areas on the planet. The city has a hot and dry climate, and built-up areas close to industrial zones suffer from the Urban Heat Island effect.

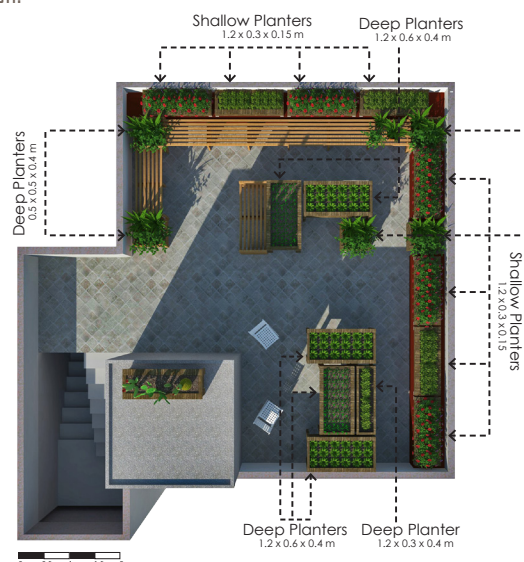
The Nile River, which flows through the city in a northerly direction, channels some cool air throughout. However, not all suburbs are located within the vicinity of the famous river. Construction and urban expansion in and around Cairo happen so fast that residents can observe changes to the cityscape on a monthly basis.

Informal areas now represent over 60% of Cairo – the majority of Cairo's houses. Informal areas are spaces where illegal construction happens on land that city authorities have not cleared for building, such as agricultural fields. Buildings in informal areas often do not follow the Egyptian building codes, can be unsafe, and are built very close together, separated only by small alleyways that are very difficult to navigate by car. In many informal areas, residents are almost able to shake hands with their neighbors across the street. Many of the unpaved alleyways are so narrow that it can often be hard to see the sky. In these quarters, residents lack access to green space, facilities of sport and leisure, as well as access to fresh and healthy food. High levels of air pollution tend to be worse in such densely populated areas which are exposed to heavy traffic and sometimes located close to major city highways. However, one characteristic of Cairo's buildings represents a great opportunity for increasing the city's green space: Cairo has thousands of flat, accessible roofs.



The urban skyline of Cairo's informal settlements, and the abandoned roofs that are usually used as storage area

Greening all, or even most, of those flat roofs could drastically transform the city. Over the past decades, universities, government ministries, NGOs and private companies have introduced rooftop gardening to Cairo. There are green roof pilot projects, research sites, development projects and urban food production initiatives scattered across the city. Most recently, in 2019, Cairo's Governor announced that rooftop gardening represents one strategic area for implementing the Sustainable Development Goals, to which Egypt is a signatory. How that can be done, and how building owners can receive training and support to green their roofs, remains to be seen.



Theoretical and practical initiatives are taking place nowadays in Cairo's informal settlements to promote the concept of rooftop farming

The American University in Cairo (AUC) and the U.S. Forest Service (USFS) have been working together since 2013 to develop simple rooftop gardening models that are affordable, easy to implement and straightforward to operate and maintain. The idea behind these modest community solutions is that rooftop gardening can only become a widespread practice across the city if people are able to replicate these systems on their own, even without external funding. The systems tested at the AUC campus include raised beds of different heights, an extensive roof, vertical planters, a hydroponic system and an integrated system combining vegetable production and aquaculture. Several years of applied research, testing and comparative analysis of different types of media mix, irrigation, shading, nutrient solutions, led to the development of systems that the researchers were confident could be scaled up across the city.



Different rooftop farming models at the rooftop of the main building of The Research Institute for a Sustainable Environment (RISE) at the American University in Cairo, a partnership project with the USFS

The considerations for successful rooftop gardening systems in Cairo are plausible, but particular. For example, Rooftop gardening systems must be lightweight, given that some buildings cannot support heavy loads. They also have to be resource efficient. In a country that is about to enter extreme water scarcity, water efficient irrigation systems, simple ways of shading, and a choice of water efficient crops can ensure that an expansion of planted areas does not equate to unnecessary waste of natural resources.

The Egyptian Rooftop Gardens Alliance

With the help of the USFS and a range of other international and corporate donors, AUC has installed 26 rooftop gardens in three cities. Almost all of them are located in Cairo's informal areas. While many of them are successful models, the job is now to connect these scattered efforts into a larger rooftop gardening network. For this reason, Tina Jaskolski and Abdallah Tawfic, both alumni of the USFS International Seminar on Urban Forestry and Community Engagement, started the Rooftop Gardens Alliance in 2019. The network brings together rooftop gardening entities and practitioners from across the city. Its mission is to create support system, to introduce new rooftop garden owners (like Khalifa) to other rooftop gardeners, and to help gardeners



Khalifa's rooftop garden provides a seating area where the family has started to spend much of its free time. It was designed and built with a group of AUC students and staff.

to access information, supplies and advice. If Cairo's rooftop gardens are to spread beyond fragmented neighborhood initiatives, then the existing gardens must become local hubs for promoting rooftop planting across their own communities, encouraging more and more people to take up the practice using even the simplest of growing systems.

Running rooftop vegetable production as a small business is one incentive for people to green their roofs. The local businesses Urban Greens and Schaduf successfully model how hydroponic rooftop systems can generate access to healthy food and provide extra income for urban families. For people who do not wish to run a business, simple and replicable models to produce food for home consumption or simply to beautify their roof spaces can improve livelihoods in Cairo's dense urban quarters. The first few meetings of the Rooftop Gardens Alliance (www.rooftopgardensalliance.net) have shown that the first seeds of a wider movement have been planted.



Successful startup Urban Greens seeks to initiate a green food movement in Cairo.



The Cairo based company Schaduf is establishing 500 green roofs in informal areas around the Cairo suburb of Helwan, where owners grow lettuce and other leafy greens in hydroponic systems



The NGO Mish Madrasa provides free after-school education for the children of the informal neighborhood in Saft El Laban. The rooftop garden, installed in partnership with AUC in 2016, has become a central space for education and outdoor learning.



OMAYYA HAKIM

PROFESSION

Biology teacher at Mattariya Secondary School for Girls and School's rooftop garden leader

"I'm a biology teacher who is in love with plants. Since 2014, our school has been actively working on gardening activities. As a teacher, I have tried to put a lot of effort into connecting the girls with the school. The girls need some engaging activities that they can discover for themselves in order to love the school, as this is their second home. I always take care of the plants in the school and try to engage students in different gardening activities, such as taking care of the plants with me."

When we started working on the roof, the Mattariya community didn't understand what we were going to do with a rooftop garden on a school. Some community members were irresponsible. [They were] throwing waste down onto the school roof, and we suffered from this behavior for a long time until we planted a garden on our roof. The responsible school teachers who attended the training with the American University in Cairo (AUC) team started talking to the community members to ask them not to throw anything down onto the school roof, as we were going to use it to build a garden. This also helped spread awareness about the idea of rooftop gardening among the community. At the beginning it was not easy, until we started working on the roof. Then the community, especially the school's neighbors, became interested in the rooftop garden's progress.

During the implementation process, we faced some problems, such as electricity and water cuts. The neighbors used to watch us while we were working on the roof. When they saw that the school's water supply was cut, a lady from the neighboring building told us that she could help us by giving us access to her water source. She threw us a hose and we took water from her house all day until we completed our day's work. Another day, when the electricity cut, another neighbor gave us access to electricity from his house so that we could complete our work. The community became very supportive, until the garden was completed. When we asked why they helped us, they replied, "simply because you are beautifying the area and changing the view right in front of us!" They started to love the idea of a rooftop garden, and due to the garden, the waste-throwing diminished.

When AUC came to introduce the idea to our school's principal, I was asked to attend the meeting, as the principal knows that I am always interested in different gardening activities. So, I volunteered to take the lead in rooftop gardening implementation at our school. I learned about the new systems and was trained so that I could manage the rooftop garden together with the agriculture teacher. Whenever I need any support or technical assistance, Abdallah Tawfic helps me as much as he can. The school either shares the garden's produce among teachers and students, or we sell it. The girls are always interested in taking from the garden's produce since they had put much effort into taking care of it.

Our rooftop garden also has had a direct impact on me. The plants give me positive vibes and good energy. The plants are not objects; they have a soul and they feel everything around them. That's why I talk to them, and I know the plants understand me very well. I can't stay away from the roof for a long time. Due to the current situation of COVID-19 restrictions, I go to the school every other day to check on the plants and to water them if needed. Even my daughter has started to come with me, and she has gotten addicted to the roof and the plants. My daughter has discovered a new passion for taking care of plants, and she has started to grow a small pot at home. Unfortunately, though, we don't have a roof [to plant on], and our balcony is very small.

I know that, until I die, I will always take care of plants.




PROFESSION

Co-founder and CEO of Mish Madrasa, an NGO that offers free after-school education in Cairo's Saft El Laban and Rooftop garden owner



ABDELHALIM WAFI

“ When my cousin Mustafa, the founder of Mish Madrasa, left Egypt to study, I became responsible for our family’s neighborhood education initiative. We teach Arabic, English, math and street survival skills to children from the neighborhood, free of charge and based on volunteerism. Since 2015, we have had a rooftop garden that we are using as an educational space for Mish Madrasa. It is where we study, play, and enjoy the greenery. Together with our children, we care for the plants. ”

I used to be a totally different person a few years ago, thinking that Mish Madrasa was a waste of time. I kept asking my cousin: ‘Do you have too much free time?’ I have a degree in tourism and hotel management, an entirely different career, but now Mish Madrasa is my passion. I got involved in the rooftop garden through something I love – making use of reusable objects. I made things for the garden using scrap pipes and wood – as you can see, most of the materials in our garden are reused. We did not buy anything.

In 2015, AUC helped us by providing the materials and tools to start building the garden. We started with a manual, conventional system, planting in pots and watering the plants by hand. We planted a variety of vegetables, including tomatoes, cabbage, herbs and rocket salad. In 2019, we received an additional hydroponic system through our partnership with AUC and the U.S. Forest Service that we now use to grow lettuce. We produce food for our household, and the children of Mish Madrasa take home some of the produce as well. This production benefits and affects them and their families. We sit on the roof with our own family, putting down our carpets and all sitting together. Young people from the neighborhood ask us if they can come and have a barbecue on our roof – they come, party, clean up again and leave. The garden has started to influence the entire neighborhood.

I am the main caretaker of the garden, but we split up tasks among family members. Our family owns some agricultural land around Saft El Laban, so we had some prior knowledge of farming. My dad planted on his balcony, so I grew up with some interest in growing plants. Saft El Laban was an agricultural area only 10 years ago. All the surrounding buildings used to be green land, but now it has all turned into built-up area. It is now all about architectural development and building for profit. Nobody thought that with the destruction of these green lands we would be left with no green breath, dying of car exhaust, both environmentally and psychologically.

I get relieved when I work with green plants and spend time every day, taking care of them. My mindset started to change bit by bit. It has an impact on the children as well. We noticed that the children’s aggressive, violent attitudes started to turn into a more peaceful and polite mode, spending time in the garden and treating their mentors and peers in a polite manner. These are things they do not learn in the streets.

So, we definitely need to have the rooftop garden notion grounded in our mentality. The children themselves are a source of strength, with their spirit and energy and the continuous love to work and spend time on the roof. ”

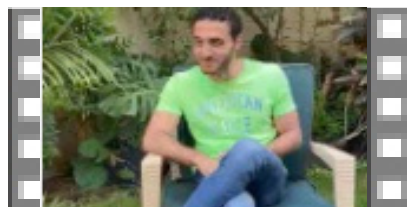




BUILDING A GREEN FOOD MOVEMENT IN CAIRO

Yehia El Masry and **Abdallah Tawfic** are two friends who founded Urban Greens, a startup company that works to raise the profile of hydroponic food production in Cairo, Egypt. The two urban gardeners have transformed the roof of Yehia's family home in Cairo suburb of Heliopolis into a flourishing oasis of greenery. Using two different hydroponic growing systems--nutrient film technique and deep water culture--Urban Greens has successfully grown lettuce, kale, tomatoes, peppers, basil and a variety of other herbs and vegetables. The startup company provides consultancy services, welcomes visitors and volunteers, runs programs for school classes and orphanages, sells their fresh produce at local markets, and donates vegetables to the Egyptian Food Bank. The two entrepreneurs aim to promote rooftop gardening as a small business opportunity that can raise the incomes of families living in the city. Throughout the two years their company has been in business, the two friends have been on multiple TV broadcasts and have seen widespread media interest in their venture. They have helped spread awareness about rooftop gardening across Cairo.

In the video below, Abdallah Tawfic shows us Urban Greens and tells us more about the company's approach.



BUILDING A GREEN FOOD MOVEMENT IN AMMAN

After returning from Cairo, **Jihad Zawaidah** burst into action. The Jordanian, representing the Watershed and Development Initiative (WADI), had attended the Middle East and North Africa (MENA) Green Cities Study Tour, together with his colleague Diana Naghwai. During the visits to Cairo's rooftop gardening initiatives, Jihad was particularly drawn to the intensive hydroponic growing systems he saw.

Hydroponic growing systems use soil-less agriculture techniques that can produce 70% more food while saving up to 90% of water. The lightweight systems can be installed on rooftops or balconies in urban areas and can help boost food production in cities suffering from water scarcity. With Jordan being one of the most water scarce countries in the world, increasing community resilience and water management efficiency have become survival strategies.

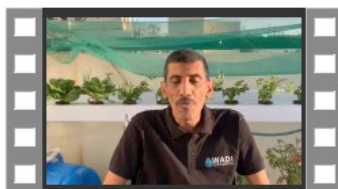


Funded by the U.S. Forest Service, WADI aims to advance water conservation and land stewardship practices in Jordan. Jihad and Diana are planning to install a simple hydroponic system as a rooftop pilot project in order to engage local women in food production. Together with their local partner, the Tal Al-Rumman Women's Cooperative, the two want to create a sustainable income generation opportunity for women. Less than one-fifth of Jordan's workforce is made up of women, with even lower numbers in rural areas. Encouraging women to start businesses on their own roofs is a promising opportunity in rural cultures where women are still being discouraged from working outside the home. Engaging women in hydroponic growing also raises awareness of water efficient living and food production.

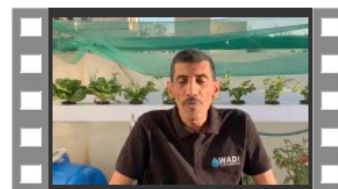
Jihad originates from Wadi Rum in Jordan's desert and understands what living with water scarcity means. When lockdown started shortly after his return from Cairo, he decided to put the extra time at home to productive use. On his own roof in the suburbs of Amman, he built a test hydroponic system with remote technical assistance from Abdallah Tawfik, the Cairo-based co-founder of Urban Greens. Besides that, Jihad set up a long line of pots in which he planted a variety of herbs. The active Jordanian hopes that WADI can replicate his system as part of the initiative's future community engagement work.

In the two videos below – an English and an Arabic version – Jihad shows us the system he has built and explains the potential it may hold for urban areas in water scarce Jordan.

English



Arabic





INTEGRATING WASTE MANAGEMENT AND ROOFTOP GARDENING IDEAS FROM APNEK, TUNISIA



Kawther Fatnassi is from Mednine, Tunisia. She is a graduate of letters and Human Sciences faculty of Rakkada, where she majored in the English Language. She joined the APNEK (Association of Nature and Environment Protection) in October 2019, as an assistant for the project of development of an integrated and sustainable management strategy for household and similar wastes in the municipality of Kairouan, Tunisia. Her passion for nature led her to join the APNEK team. She currently lives in Kairouan, Tunisia. When she's not busy in the office, you can find her in the gym, practicing sports.

Kawther Fatnassi, represented the Tunisian non-governmental organization (NGO), APNEK, at the Middle East and North Africa (MENA) Green Cities Study Tour in January 2020. APNEK stands for Association for the Protection of Nature and Environment of the Governorate of Kairouan. APNEK's mission is to support sustainable development efforts by taking a participatory approach towards fostering a healthy living environment that benefits the well-being of individuals and communities. During the study tour in Cairo, Kawther presented the organization's goal to embark on a new project focused on household-based organic waste management in her Tunisian hometown of Kairouan.

Combining home composting, upcycling and rooftop gardening

APNEK is planning to provide citizens with home composting bins that would enable each household to manage their organic waste. According to Kawther, waste management systems in Tunisia are very limited and many citizens have to find their own ways of managing quantities of solid household waste, often with limited financial resources available. There is a lack of strategic vision towards applied and integrated waste management that tackles the problem in a sustainable way, Kawther explains, and communities are often left with no other option but to put all of their household waste into large shared collection bins. Over time, these bins fill up and solid waste starts polluting entire suburbs.

The home composting project aims to generate new synergies between waste management and rooftop gardening. Rooftop garden owners can reuse waste, such as pieces of wood or plastic cups for planting on their roofs and for making decorative objects from reused materials. Green waste can be turned into compost used as natural fertilizer for the plants. This creates a nice waste management cycle that connects recycling and rooftop gardening. The organization believes that encouraging people to take up rooftop gardening would give them an ideal place for utilizing the homemade compost.



Examples of plants growing in reused containers in Kairouan.

In Tunisia, rooftop gardening is still a relatively new idea. It is an innovative approach that raises the value of roofs and puts them to use. Rooftop gardening, as Kawther maintains, can be a unique experience for the owners. So far, there is only one rooftop gardening trial in Tunisia that was implemented in the capital, Tunis. The initiative was implemented by a Tunisian organization with support from the German Embassy in Tunisia, but the idea is not yet sufficiently well-known across the country.

Kawther emphasized that participating in the MENA study tour has given her more knowledge and new ideas about how to manage waste. She was especially interested in the visit to Cairo's informal waste collector community, the so-called zabaleen, where the Spirit of Youth Organization and the Association for the Protection of the Environment showed the participants their recycling initiatives.

Even if people in Tunisia lack space to perform waste management practices at home, roofs can be used and decorated to spend time in, and at the same time enable recycling practices. While the program is still in its conceptual phase, Kawther and her colleagues are hoping to report on the first successful integrated waste management and rooftop gardening pilot project from Tunisia soon.

Engaging women and youth in waste management efforts

Besides the home composting initiative, APNEK has worked to engage youth, women and differently abled people in waste management and recycling initiatives. For World Cleanup Day 2019, Afaf Zaddem from APNEK, a 2019 graduate of the USFS' International Seminar on Urban Forestry and Community Engagement carried out a recycling activity and awareness campaign by engaging young people to collect plastic bottle caps for an art project. One of APNEK's main programs is the integration of differently abled people in the economic sector according to the economic and environmental context of their home communities. Mobilizing funds that enable the implementation of projects on the ground to advocate and raise sensibilities regarding differently abled people in society and to increase the advancement of their particular skills and capacities is another objective for the organization.

World Cleanup Day upcycling activities in Kairouan, led by APNEK.



Ensuring that local development is inclusive

Supporting the roles of women and children-- ensuring that they are active partners in selecting, designing and implementing sustainable development projects and programs-- is important to APNEK. The NGO works with organizations to protect natural environments and to help achieve not only Sustainable Development Goals, but also strategies for inclusive social and economic development set forth by the Tunisian government. It focuses specifically on strategies of social inclusion and solidarity, as well as integrative and inclusive development approaches that generate income and employment and that help raise the profile and wider implementation of environmental education and environmental citizenship in Tunisia.

Below: In Cairo, Kawther particularly enjoyed the visit to the NGOs who promote recycling in the city's waste management community.





FOSTERING GREEN LEADERSHIP AMONG PALESTINIAN YOUTH THROUGH ART AND ENVIRONMENTAL EDUCATION



Samih is an artist and Director of the Palestinian Child Arts Center (PCAC). He has experience in graffiti art and children's art, and has an important role in training and designing cultural programs for children and youth. He has taken part in many conferences in the USA, Palestine, Arab countries, and other international conferences and seminars. He is also responsible for many programs for raising awareness and dealing with art and graffiti issues. The aim of these programs is to explore how to use art in a peaceful way, and keep the children of Palestine safe.

Environmental work with children and youth in Palestine

The study tour representative from Palestine was **Samih Abu Zakieh**, an artist and founder of The Palestinian Child Arts Center (PCAC), which engages youth in a variety of programs in order to promote creativity and culture. Each year, their staff gather to decide activities, programs and projects that range across a number of subjects, including environmental education and awareness.

According to Samih, Palestine suffers from a plethora of environmental issues, some of which have been exacerbated by the occupation. He has witnessed trees being cut down, forests being taken over for the development of settlements, illegal drilling of groundwater wells, as well as waste management problems and littering. The population suffers from extreme water shortages and from increasing pollution.

Mentoring young leaders

In light of these problems, it is important to teach children about environmental issues and to provide them with the confidence that they can become leaders who can make a difference. One of the Palestinian Child Art Center's programs is called "Smart Leaders." The program hosts 100 children--between 12 and 16 years of age--who participate in a weeklong summer camp that focuses on environmental issues in Palestine. Participants get to visit environmental museums and complete environmental tracks, as well as taking part in a variety of art and music activities. The program is designed to develop capacity in children and youth to grow into environmental leaders in Palestinian society.

The center also offers a program called Environmental Chat, that brings together children and youth in weekly meetings to discuss environmental issues. The Environmental Conference, in turn, is an annual meeting that gives children and youth the opportunity to present and discuss environmental issues and initiatives they have worked on in the local community. Increasing children's knowledge and giving them a voice on environmental issues is key to the organization's activities. In order to increase the children's motivation to participate, all program participants are given certificates for having been part of local and international conferences, as well as trips and excursions.



USFS Program Manager Kristina Bell poses with Palestinian youth at PCAC's annual Smart Leaders Conference

Gender can be a cultural challenge for youth programs in the Middle East. The participation of boys and girls in a mixed program is not culturally accepted in the city where Samih's organization operates. The center approaches this challenge by engaging younger boys than girls in their activities, which makes it more culturally acceptable for them to jointly participate in a youth program. The presence of both male and female trainers further helps to generate trust in the program within the local community. "Support and sponsorship from local companies shows us that community trust in our activities is growing," says Samih.

The power of art

Samih is a talented artist who believes that art can change people. He established PCAC in 1994 to offer artistic activities, such as drawing, music, and theater, to Palestinian Children. "Children love art, it is one of their favorite things!" says Samih. As an artist, Samih has created art murals with environmental themes and has organized art exhibitions for children's environmental drawings and models. As the study tour in Cairo came to an end, Samih gave each fellow participant a symbol of peace and cooperation that he had drawn in his hotel room.



Samih presents children's artwork to USFS Program Manager Kristina Bell in Palestine.

Experiencing Egypt

While in Egypt, Samih instantly bonded with children and youth at the various project sites the study tour participants visited. At each site, he asked the youngest participants how they felt about and experienced the project, always making sure that their feelings and opinions were heard. "Egypt will always be the mother of the world (Um El Donia)," Samih laughs, "Since I travelled back to my beautiful home Palestine, my heart has continued beating with love for Egypt and the Egyptian people".

Samih planted seedlings in Cairo and connected with children in the Delta village of Shubra Qubala.





THE EGYPT ROOFTOP GARDENS ALLIANCE'S NEIGHBORHOOD “BUILDATHON”

BY: TINA JASKOLSKI

Linking Rooftop Gardening Efforts Across Egypt

In Egypt, there are multiple initiatives on rooftop gardening that have been started by NGOs, government research centers, universities, or as part of community development projects. In 2019, affirming the strategic importance of urban gardening, Cairo's Governor announced that there will be future plantings across all of Cairo's rooftops as part of the city's contribution to the country reaching its Sustainable Development Goals by 2030.

Cairo is a densely built city with crowded spaces, lack of access to green areas, and high levels of air pollution. Hot, arid temperatures, the need for irrigating plants, and water scarcity create challenging conditions for greening urban spaces. However, Cairo has a unique resource: thousands of flat, accessible roofs that can potentially support gardens.

Although many existing rooftop gardening initiatives in Cairo are very successful, these initiatives remain fragmented and disconnected from each other. Having learned from American urban forestry networks that they saw when participating in the U.S. Forest Service (USFS) International Seminar on Urban Forestry and Community Engagement, Tina Jaskolski and Abdallah Tawfic (alumni of the 2018 and 2019 seminars, respectively) thought of linking up the Cairo-based rooftop garden initiatives.

An Alliance of Rooftop Gardening Pioneers

In October 2019, Tina and Abdallah, together with USFS project manager Mariam Dawoud, started the Rooftop Gardens Alliance. The network brings together a large variety of entities and people involved in rooftop gardening in Cairo, including businesses, NGOs, government organizations, schools, individual rooftop garden owners, as well as students, researchers and people who are simply interested in the concept of rooftop gardening. The group has met three times since September 2019 and is working on an agenda to jointly advance rooftop gardening across Cairo and Egypt. As rooftop gardening is still not as widespread in Egypt as it might be in other countries, information, support, materials and supplies for rooftop gardeners are still relatively hard to come by, especially in the financially disadvantaged parts of the city. The Rooftop Gardens Alliance aims to become a “go-to” place to provide help and advice for all those who have a rooftop garden, and those interested in learning more about them.

Let's Start With What We Have: The Neighborhood Buildathon

The neighborhood Buildathon was the Rooftop Gardens Alliance's first joint activity. An idea the graduate student Abd El Hamid Sherif had during a Design Thinking class on rooftop gardening held at the American University in Cairo inspired the event. Abd El Hamid had just returned from a hackathon event, when it occurred to him that a “buildathon” might be a great idea to get people in Cairo's financially deprived neighborhoods to take up rooftop gardening. The idea is simple: find any scrap material you have on your roof and turn it into a rooftop planter!

On February 7, 2020, a mixed group of people came together to do just that – local residents, children, students, volunteers and even some participants of the Middle East and North Africa (MENA) Green Cities study tour who were still in Cairo and wanted to be helped out. In the neighborhood of Hattaba, El Khalifa, located right at the bottom of Cairo's famous Citadel fortress, the group ransomed all materials found on a local roof that was stashed with scrap material. Old furniture, pieces of wood, metal, parts of sculptures – all of these pieces were brought down and piled up at the street level. Now the group began a wild process of impromptu, improvised design and carpentry.



Children of Hattaba has used their imagination and the scraps found around them to build planters

Throwing out ideas and working together, the process felt creative and liberating. Due to the abundance of old chairs, the team quickly came up with the prototype of a “chair planter”. A large planter inside a metal frame, a crazy red deconstructed planter made from various chair pieces, and small box planters took shape throughout the day. Local children painted the planters, mixed media, and planted seedlings. The idea was to teach neighborhood residents the components of a simple planter design in a fun and interactive way, inspiring participants to upcycle old material into a garden, with minimal funding.

If rooftop gardening is to become a widespread practice across Cairo, then simple, affordable and easy-to-replicate solutions that people can build themselves are the way forward, especially in less fortunate neighborhoods. Participant feedback on the Buildathon was clear: Let’s do this again soon! Two participants from another Cairo neighborhood liked what they saw so much that they are planning to replicate the idea in their own neighborhood.



AUC students support children of Hataba in the design and implementation of different planters

Jihad Zawaidah, a study tour participant from Jordan, gave up his day of sightseeing in Cairo to join the Buildathon. He quickly became “head carpenter” of the day and immediately bonded with the local children.

“The volunteers gathered, including some people who brought their children to participate, everyone reaching out to help recycle and reuse old chairs to make them into agricultural containers. The mission started at about 10:30 AM and continued until 3:30 PM. We did not feel the speed of time, we enjoyed that we helped the people in the neighborhood by making containers for planting and planted the seedlings. Some children from the neighborhood helped us paint the wood with beautiful colors. I did not feel the time pass, as I was helping to accomplish something that will increase the beauty of the region and help provide families with the food they need in the future. I returned to my country, Jordan, after having established new friendships with some of the neighborhood’s residents, and was carrying with me new things that I had learned during my volunteering. I loved that, and I am looking forward to doing this again and again, especially in Cairo.”

Melissa Smith, a graduate student of Sustainable Development at the American University in Cairo, who has helped design the first rooftop garden in Hataba, participated with her whole family.

“I am always eager to turn talk into action, and the Buildathon in Hataba was a chance to do this. What made it even better was that I could involve my children and husband. Working together alongside Hataba’s children and community builders, NGO members from Egypt and Jordan, AUC students, technicians and professors, and the cool folks from the US Forest Service was exciting, because it felt like we really were part of a “growing” movement. I have read about the integral role of collaboration to meaningful community development and “dug” the opportunity to put it into practice, building upcycled planters for urban gardens.”



Jihad Zawaidah



Melissa Smith

THE SOCIAL IMPORTANCE OF ROOFTOP AND URBAN GARDENING



Dr. Erika Svendsen, Social Researcher and Director of the U.S. Forest Service's (USFS) Urban Field Station in Queens, New York, served as the technical expert for the USFS Middle East and North Africa (MENA) Green Cities Study Tour in Cairo.

Here, she shares her thoughts about rooftop and urban gardening in both the USA and the MENA region, the importance of community, champions and networks, as well as the special role of urban greenery in times of a global pandemic. Erika has authored and co-authored many publications about communities and urban gardening and forestry, as well as on the role of urban green spaces for environmental and public health. She is an expert on the history of community gardens in New York City. As a social researcher, Erika loves capturing the stories of individuals and groups who shape lived urban experiences.

As a social researcher, what would you say about the importance of rooftop and urban gardens during the current pandemic we are experiencing?

In many ways, the importance of rooftop gardens and greening, in general, remains as important as ever. It is a source of local food, beauty and comfort. During this pandemic, tending to plants

may provide an opportunity for people to regain a sense of control in their lives, even in some small way. Plus, we know that gardening and urban forestry inspire creativity and innovation.

During this challenging time, we can still find ways to spark our curiosity, adapt and discover through our observations and care for nature. Rooftop gardens are especially important because they can be viewed at different vantage points. Rooftop greenery provides a visual, outward beauty and provides a cooling element that is so critical as we move into warmer weather. Green roofs often attract birds that bring the sound of birdsong closer to our living spaces. At the same time, many people watching from their windows may find comfort in knowing that there is a neighborhood gardener or forester who is 'out there' and caring for the world around us.

What are some of the examples you have witnessed of people trying to "green their quarantine"?

I have been fortunate to be able to walk outdoors during this time and have certainly seen many 'fellow travelers' in public parks and open spaces. I've noticed that people have slowed down a bit more to take in the beauty of nature, perhaps in a way they had never so done before in their neighborhood park. Walking around my own neighborhood (in New York City), I've seen people setting up all sorts of containers in front of their homes and tending to street tree boxes along the sidewalk. In fact, this year, some of my neighbors are now using their front yard spaces to grow vegetables and flowers instead of green grass. In New York City, the parks department has given city residents a number of virtual ways to appreciate urban nature while staying safe at home. Staying connected to nature, even if it is from within my apartment, is important to me!

You participated in the USFS MENA Study tour at the beginning of the year. What did you learn about urban farming and agriculture in the Middle East during your visit to Egypt that is different from what you would see in the US?

Without question, the issue of water scarcity is much more 'intense' in this part of the world. Typically, the majority of my work is based in the glaciated and temperate northeastern United States where we still must manage for water, especially in cities, but it is on a way different scale than in Cairo. Of course,

the Nile River Delta is ancient fertile ground for agriculture and great feats of engineering and irrigation designs. While I was in Egypt, my kids were back home actually learning about the history of the Nile River Valley at the same time. We had some interesting conversations about the past and present. Of course, today's population and development pressures should not be understated and seem to require some bold steps forward yet sustainable practices cannot be achieved without tapping into local community networks and addressing current needs.

When visiting villages and farms outside of Cairo, it was quite moving to learn how local leaders are reconnecting to their historic and honored past by devising community-based ways to address issues of water conservation in one of the most densely populated regions in the world. **In reconnecting people to their agricultural and riparian roots, so to speak, I learned that it is important to start with small and manageable projects and continue to build from there.** For example, a lot of the work by Urban Greens and the rooftop garden entrepreneurs in Cairo features accessible materials and designs that take into account the unique conditions in the city's informal settlements. Still, a key lesson that I learned was that good design is only part of the solution. Equally important was to encourage residents to see differently, especially to find value in their own communities. And to find ways to believe in change.

Tell us about one or two very striking experiences you had during the regional study tour in Egypt.

It is nearly impossible for me to choose one experience when the entire study tour was so memorable. The people we met and the parts of the city we traveled to and beyond all held special meaning for me. But I will say that over our week together we weaved together a singular story and purpose. **Each one of us began the journey with our own areas of expertise and from our own places, but by the end of it, we had entered into an exchange of cultures, experiences and shared purpose.** We were able to communicate on a new level where we could talk about the vulnerabilities in our work and discuss the challenges without judgement but only constructive concern. And there was a lot of laughter.

I will say that I will always remember visiting a productive green rooftop run by Mish Madrasa, an NGO with a social mission to educate and empower youth to be critical thinkers in their 'idea lab' focused on solving community issues. I believe that the building there has stood for nearly 100 years and had once been surrounded by agricultural lands as far as the eye could see. Today, when you look out from the roof you see a seemingly endless expanse of buildings of the informal settlements, with some displaying colorful flags, bird houses and tapestries. If you look off into the horizon from Mish Madrasa, one can see the pyramids come into view. Such an architectural and cultural marvel. I remember looking back at the smart but simply designed planter boxes, water pumps, pipes, and children laughing on the green roof and thinking that for our times, this urban green social project may indeed be the 'new marvel' for this special city and its people.



Visiting the rooftop garden of the NGO Mish Madrasa in Cairo.

You have met some of Egypt’s “champions” of rooftop and community gardening. What did you learn from them?

Indeed, I was very fortunate to meet some of the superstars of urban greening in Cairo during the study tour. I was so impressed with the dedication of the leaders working with Urban Greens, a start-up local business dedicated to adapting agricultural practices to the city, and other amazing people in their network who are finding ways to innovate and grow productive yields of produce in some of the harshest urban conditions.

Water scarcity is more than a concern here but rather, a way of life. Using a variety of techniques and adaptations, these green entrepreneurs have found ways to innovate using basic, accessible and often affordable materials. In Cairo, I witnessed such a strong entrepreneurial spirit and desire to learn from each other about everything—from improving irrigation systems to seed stock to market strategies. But what I observed most especially in Cairo was that this local technological knowledge was advanced because of the generosity, patience and care that many felt was also part of the pride of community and culture. In this way, it seemed that Cairo’s green champions cared as much about the relationship between air, sun, water and soil for the plants as they did about each other learning how to plant, grow and succeed. I found that the path to sustainability in this city may be paved by reciprocity, joy and determination.



Dr. Erika Svendsen during her visit to Urban Green Egypt in Cairo

One of the main take away lessons from the Middle East study tour was the importance of networks. How do you see networks playing a particularly important role in this region?

Social networks are important for any number of reasons but do seem particularly critical in places where everyone might not have the same or equal access to information, technology or the direct opportunity to see that change is possible. It is through social networks that people can gain access to new ideas about funding, techniques, potential partners or support. It is important to know that social networks are powered first and foremost by people. And that social networks function most effectively when there is a meaningful connection, a mutual trust or understanding that underpins the cooperative nature of a social network. In this way, a network grows and deepens as stories, experiences, and ways of knowing are woven together, like a trusted friendship.

During the study tour, the regional participants all presented their approaches and projects related to urban forestry. What are some of the lessons learnt that could help advance urban forestry in other regions of the world?

Without question, one of the most important lessons from the alliance emerging among many of the urban greeners from Jordan, Lebanon, Egypt, Palestine and Tunisia is an openness to share and learn from each other. Everyone seemed quite comfortable playing both roles of teacher and student and this would include sharing as many of their failures and hardships as well as the success stories. As I think about the study tour, I feel that there are experiences here that are common to other parts of the world to help ‘advance’ urban forestry. First, it seems that there remains a stigma regarding community or local knowledge vs. technocratic expertise. Of course, both are needed. There are many ways of knowing, and urban forestry can tend toward a technocratic approach rather than understanding ways to use urban greening as a catalyst to address social and economic issues.

During our site visits, I was so moved by our hosts as they shared the ultimate purpose or aim that underlies their work. It was not only to green the streets (and roofs!) but to address equally important social concerns, including unemployment, poverty, or community health. Second, I heard a lot of the familiar refrain from the urban greening community— and that is when they do grab the attention of funders or policy-makers, the comment is usually, “What you are doing here is great but it’s only a small-scale project. How can you scale it up?”

Well, one of the ways to do this is to invest in people and support their local organizations. Scaling up requires the purposeful and trusted work of organizations and supportive social networks. From what I observed, accessing quality seed stock and tree seedlings is a much easier task for groups than having the organizational capacity for a forester, ecologist, designers or community organizers on-board. I know that this is the same in many other urban forestry and greening organizations throughout the world.



Erika during her visit to the rooftop garden of Khalifa the rapper

Several of your research papers touch on the aspect of stewardship and resilience. What are the things that you would like to see in a post-Coronavirus world that people may have learned during the crisis?

Learning to adapt in a way that includes equitable and humane practices. That we practice the art of direct observation and take the time to really see what is happening in the world around us. That we take from this a new appreciation of nature – the sounds, sights and beauty, yes, but perhaps a renewed sense of our role within it. Hopefully, we will have learned how important our park workers, foresters, community organizers and local volunteers are everyday but also during times of crisis. They are an essential workforce performing an essential service—caring for nature benefits us all.



GARDENING TIPS FOR HOMEGROWERS AND URBAN FARMERS

BY: ABDALLAH TAWFIC

Starting the adventure of creating your own garden is both a fun and rewarding way to not only make your home more appealing, but it's also an excellent way to spend more relaxing time around green spaces as well as produce your favorite types of fruits, vegetables or herbs. Planting successfully in your backyard, on a roof or balcony could be achieved following simple guidelines. If you're new to gardening, the following tips will help you green your space, and simplify your planting experience.

Space design

The first and most important tip is to think of how you will design your space. If you know what you want to include, managing the space dedicated for planting could be usually done without the need for specialized landscape engineers. Think about accessibility of your planters as well as sufficient pathways around your planted area. If you don't have a lot of planting experiences, it's better to start with a manageable surface area, and expand incrementally as you gain more experience. Don't forget to include seating and shading elements in your space design. Such features will make your planting experience easy and pleasing, and will encourage you directly to spend more time in your garden, and will help in creating a positive and relaxing connotation towards your space.

Planting techniques

There are several planting techniques that you can implement in your garden, roof or balcony. If you have a yard or a garden, the easiest way is to directly plant in the ground. If you want to ensure the quality of your soil you can always send a sample to the lab to test its validity for planting, or if you have the knowledge you can improve its characteristics by adding soil-enriching supplements (and/or natural compost) which are usually available in any plant shop.

If you are planting on your roof or your balcony, your techniques will not go out of the following three techniques: 1- Intensive/extensive garden , 2- Containers Garden, 3- Hydroponics/Aquaponic Garden.

Intensive/extensive Garden requires specialized companies that will analyze your roof conditions, in terms of insulation, roof load bearing capacity, and the water/drainage sources. Intensive/ Extensive gardens are basically systems that fully or partially cover your space with layers of root barrier, insulation, drainage and topped with soil of different depth that allow you to have a similar feeling and experience of a spacious planted area like a yard/garden, directly on your roof.

Containers Garden is a very flexible option for planting on the roof or in a balcony. Characterized by the flexibility in materials and techniques, the concept basically consists of raised container(s) of any material type/size that contains soil or growing media (more preferable since it's lighter in weight compared to soil). The container is usually raised to allow for proper drainage of water after plants irrigation. We suggest that you promote the Triple R's approach (Reduce, Reuse, Recycle), and utilize local materials for your containers that are eco-friendly and of reasonable prices in your nearby local market (recycled wood/ bottles/ plastics..etc.)

The third technique is hydroponics/aquaponics. These are water-based systems, characterized by their amazing water efficiency and high yielding capabilities. **Hydroponics** are usually technical systems that require electricity and tubing/fittings/ pumps/etc. There are different techniques of hydroponic growing, the simplest and most popular of which are Deep Water Culture and Nutrient Film Technique. You can easily set a simple hydroponic system at home using pvc pipes, a plastic tank, submersible pump and basic fittings. If you haven't tried it before, it's better to look for home Hydroponics DIY videos on the internet or consult an expert in the field to help you select the most suitable technique for your plants and space.

Aquaponics is the same concept as hydroponics, but with aquaculture added to your system, instead of nutrient solution. The natural concept is based on fish producing waste, which is nutrient rich and very much beneficial for the growth of the plants. The plants after absorbing those nutrients also help to filter the water for the fish in a natural closed loop. In practice, aquaponics on larger scale systems require different filtering techniques and special care for the fish. It is always better if you have enough experience in dealing with operations and running of fish tanks before starting an aquaponic system (especially on bigger scale).

Make sure to wisely choose your planting technique based on your gardening plan, your previous planting experiences , the dedicated space for gardening and the dedicated time you are willing to spend in your garden every day.

Irrigation

A very important aspect to keep in mind is the amount of water/fertilizer you give to your plant. Different plants have different water needs; however, you will be surprised to know that the manual hand irrigation technique usually consumes more than the plants need. If you have the chance to install drippers to your planters, it will help the plant absorb the sufficient amount of water over a longer period of time and will also help in decreasing evaporation of water consumed in manual irrigation, not to mention provide a significant water savings compared to manual irrigation.

To develop the skill of when to add water, dip a long wooden BBQ stick or chopstick on the side of the pot after watering the plant and you will find that the dipped part has peat moss and water round it. Keep repeating this simple test every day until you find that the water and soil appear below half of the dipped area. When that happens, then you can add water.

Fertilization

Plants always needs nutrients to properly grow. The way plants find the nutrient when planted in the ground is through the soil that contains natural nutrients from naturally decomposed materials (fallings/dry leaves/etc), or it could be supplemented to the soil through external compost/nutrient solution. Prepare a periodical fertilization schedule for your plants to allow for a healthy growth and proper production.

Solar exposure

Plant solar exposure is an essential aspect to allow for photosynthesis and the proper growth of your plants. It is preferred to do a solar exposure analysis at your designated gardening space, and it is preferred that your space receive at least 6 hours of direct sunlight if you wish to grow productive crops. Some plants can grow in partial sun, partial shade and full shade. It is recommended to analyze the solar needs of your plant and compare it to the solar exposure of your space before planting. You can always use artificial lighting to compensate the lack of natural light. There are different variety of LED, fluorescent lights specifically dedicated for supporting plant growth.

Plant selection

It is important to consider types of plants before gardening. Succulents, for example, require different planting conditions, operations and care in contrast to what is needed to grow productive leafy crops. Knowing early the types of plants you would like to include in your garden will help you make the right decision for the best soil/media mix and the types of fertilizers needed, as well as the irrigation pattern and solar needs required.

Make sure to respect spacing between plants in the same planters to allow for comfortable growth of every plant until reaching maturity. It is also important to look up the different types of companion plants in the same planter. Companion plants boost growth, repel pests, and improve flavor for each other. Aside from the benefits to your plants, companion planting uses your garden space more efficiently, letting you harvest more. The diversity that companion planting provides is also good for pollinators, wildlife, and soil health.

Pest control

It is very common as part of the natural ecosystem to find pests that are trying to attack and feed on your plants. Healthy plants that are growing in proper environment are less susceptible to get attacked by insects because of the plant's proper immune system.

There is a common, natural and sustainable way to counter back some pests. Certain types of plant have natural ways and/or special scents that can repel predators and protect your plants from attacks. Another way is to use designed traps, but you will need to identify the insect species to properly select the right trap. You could also spray your plants with natural pest repellants, like, citrus oil, hot pepper, or Neem oil.

Examine your plants regularly for any trace of pests, and strictly isolate any infected plants, if possible. Early detection and isolation could save your garden from a possible infestation.

There are now mobile apps that can identify pests and insects by just taking a photo, and the app will compare your photo to their database and identify the species for you as well as recommendation for different control measures. Leave chemical pesticide as the last resort, in case you can't control your pest issue. Always use only certified pesticides brought from reliable suppliers and follow all safety measures when applying them.



PROMOTING ROOFTOP FARMING THROUGH COMICS

BY: MARIAM DAWOUD

The idea of the comic came to Mariam Dawoud, a project manager at the American University in Cairo (AUC) when she was attending the local community meeting of the 1st rooftop garden with Khalifa the rapper and the AUC master students working on this project. From this meeting, it was very clear that the local community would prefer visual awareness materials more than reading materials and direct written instructions. Accordingly, Mariam contacted a faculty member, Dr Mahmoud Shaltout --who is also a talented caricaturist and comic creator--and discussed the idea of creating an illustrated comic booklet about this project. Along with Mariam, AUC students from the Spring Class of 2019 participated in the developing the storyboard. A couple of meetings were held to agree on the booklet storyline, the characters, designs, colors, etc. The comic (featured in the next several pages) was the outcome of 5 months of collaborative volunteering and hard team work.



Cover Page

→ Plant your rooftop by yourself !

-Written by:

Mariam Dawoud

Salma Khalil

-Drawings by:

Mahmoud Shaltout

Kid: Khalifa (in the red cap), we want to see the rooftop after it is done!

Khalifa: Yes, let's do that and I will also explain to you how I learnt to do it with the help of Tina and Rashad!



Page 1



Girl: I painted this piece of wood!

Boy1: Oh my god, this is so beautiful!

Boy2: And I helped in making the mixture that we planted in...I also helped them in planting.

Page 2

Khalifa: This garden is very beneficial to us because it makes our area beautiful and we also use things that we do not need and were going to throw away.

Second picture: It also increases the percentage of greenery and plants in our area, reduces the pollution and cleans the air.

Right picture: We can gather in these places and the ladies can use it to spend nice time in the morning there without having to go far to the public gardens.

Left picture: It also has a very efficient irrigation system, which saves water and helps our country with the shortage of water, the crisis that we suffer from.



Page 3

Tree text: And the people who have bigger spaces can plant vegetables and herbs to sell or eat, this way they save money for the family. Those are all benefits that would motivate us to plant on rooftops.

Kid: How did you do all of this?

Khalifa: First of all, you need to make sure there is a source of good water, then we installed pipes for water and drainage.

Khalifa: After that we put tile on the ground to make the place look good and make it easy to clean. We constructed this shading pergola to be able to gather under it and spend a nice time!



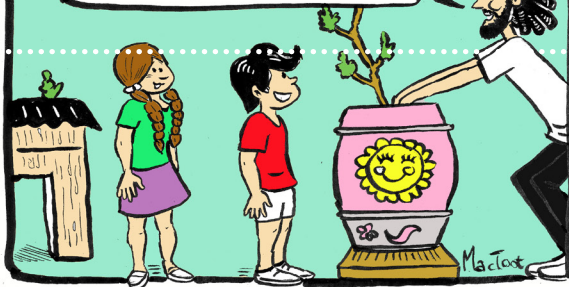
Page 4

تعالوا اشرككم إزاي ممكن نستفيد من حاجات إحنا مش عايزينها زي البراميل الفضية القديمة وعلب الدهانات الفضية والكاويتش القديم والمواسير القديمة. وكمان لو فيه خشب ممكن نجعله ونعمل منه صندوق ونزرع فيه



كل إشي محتاجينه الحاجات دي هو ترميم وتلوين علشان يكون شكلها حلو، وبعد كده نجعلها للصرف ...

ولو حاجة خشب نخط فيها عازل علشان الخشب ما يبطنش



→ **Khalifa:** Come, I will explain to you how we can use things that we do not need like old barrels, paint cans, old car tires and old pipes. We can also use wood pieces to make a box and plant in it.

→ **Khalifa:** All we need is repairing these things and painting it to look beautiful and then prepare it for drainage....

And if we use wood, we need to put insulator so that the wood doesn't crack.

Page 5

Boy: I remember when we gathered to paint the wood, car tires and boxes.

Girl: And we were exchanging colors with each other. The colors made the roof looks so beautiful and we were happy while painting. Where are the small wood pieces we were painting?

Tina: We made square shaped pallets from the wood pieces, and we use these pallets to put the barrels or the other things we use in planting on it to be able to install drainage pipes from under it and preserve the system.

Page 7



Page 6

First picture: We made these green wooden pallets because it is important to get rid of the water that the plants do not need. If we do not preserve a drainage system, the soil will be bad and this will make the plants die. Also the extra water could damage the building which is dangerous for the residents.

Pictures from right to left (1): The drainage system is very simple!

(2): We make a hole in the barrel for the pipe.

(3): And we put on it from the inside a filter and some stones to protect it from getting blocked or becoming rusty.

(4): We install the drainage pipe from outside and that's it!



Khalifa: I heard that you made the alternative for the soil...who can explain how you did it?

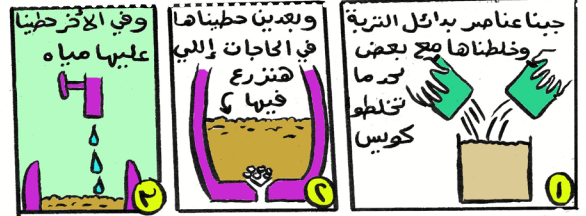
(1): We brought alternative elements for the soil and mixed it together.

(2): Then we put it in the containers that we will plant in.

(3): In the end, we put water.

Rashad: we also need to add fertilizer with it or mix it with the irrigation water to make fertilizing liquid. Fertilizing is very important for plants because it is like the food that makes plants grow and become healthy. The fertilizer is mixed with the soil in the beginning, but the liquid can be added twice per week in the irrigation water.

أنا سماع إنه انتو إلي عملتوا بديل التربة ... مين بيشرح لنا عملتوها لوزاي؟

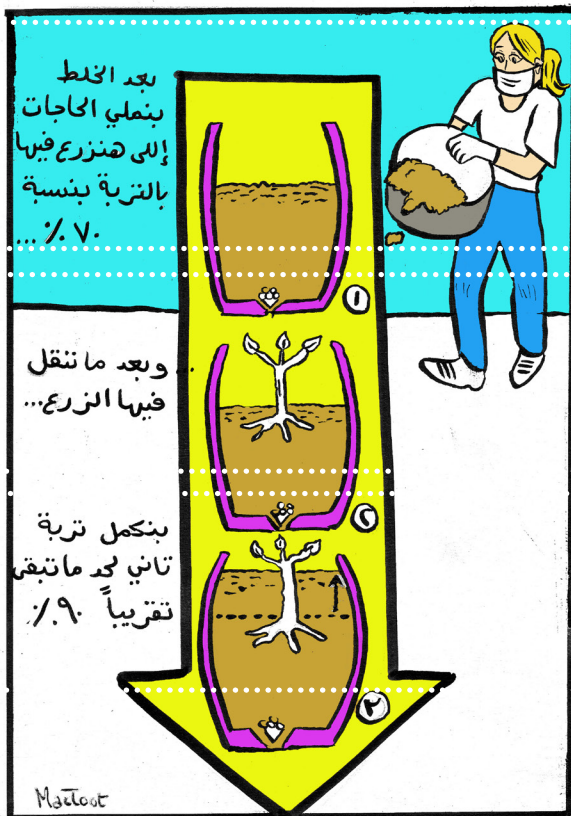


وبتحتاج كمان تزود سعاد معاهم أو نبقا تخلط مع مياه الري مخلوط تسميد. التسميد ده مهم للزرع علشان ده زي الأكل إلهي بيكبر الزرع ويحلي صيته كويسة. السماد بيتخلط مع التربة الأول، لكن المخلوط بيتخط مرتين في الأسبوع في مياه الري

Tina 1: After mixing it, we put it in the containers we are planting in, but we only fill 70% of these containers.

Tina 2: Then we plant the plants.

Tina 3: Then we add more soil to fill about 90% of the containers.



Boy: The plant in the small pot, we turn it upside down and take the plant out.

Boy (right): then we put it in the soil alternative in the planting container.

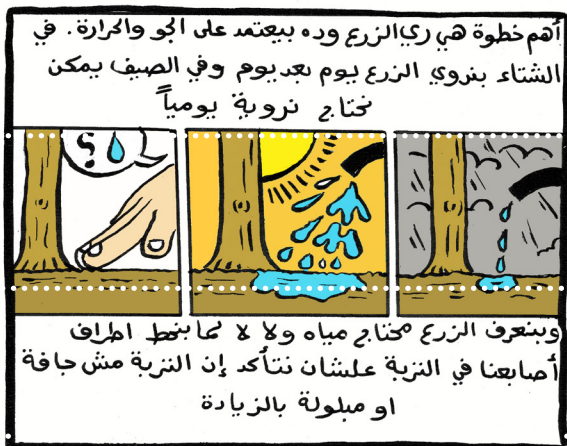
Boy (left): and if the pot is made of pottery there is no way but to break it to move it to the other container.

Tina (right): we can plant many things. For example, winter crops like tomato, coriander, dill, parsley, strawberries and cauliflower.

Tina (left): As for summer, we can plant pepper, eggplant, cucumber, zucchini, mint, Rocca, radish, green beans and mulukhiyah (Jewmellow).



Page 10



- 1: The most important step in planting is irrigation and it depends on the weather and temperature. In winter, we irrigate the plants once every two days and in summer we may need to irrigate it daily.
- 2: We know if the plant needs water or not by putting our fingers in the soil to make sure it is not dry or very wet.
- 3: We use water saving irrigation systems like dripping to save water and only add the amount that the plants need. Adding a lot of water kills plants.

Page 11



Page 12

Khalifa: There are different kinds of plants. There are Ornamental plants like the one on the pergola. It makes the place beautiful and lives for a longer time.

Khalifa 2: There are the fruitful plants that we eat. This kind of plants is seasonal.

Khalifa 3: Another important thing, we need to put the plants in boxes or barrels that are suitable for the size of the roots of each plant to give it the space that makes it grow well.

Page 13

→ Girl: why this plant looks sick unlike the rest?

→ Tina: sometimes plants get eaten by insects and birds.

→ 3: We can spray black pepper with water on the plants to protect it. This way we use a healthy and environmental pesticide.

We mix some water with black pepper, then we put it in a spray bottle and start spraying.

→ 4: Make sure that the wind is not strong while spraying so that the spray does not get into your eyes.





Tina: " Enjoy your Meal " - End

ABOUT THE CONTRIBUTORS:



About the Contributors

TINA JASKOLSKI

Tina Jaskolski is an assistant professor of sustainable development at the School of Sciences and Engineering at the American University in Cairo (AUC). Jaskolski also teaches for the master of sustainable development degree program and has previously taught at the Institute of Gender and Women's Studies. She holds a Ph.D. from the Australian National University in Human Geography. Jaskolski has carried out research on sustainability and education, governance and community development in Australia, Indonesia, Germany and Egypt. Since joining AUC in 2006, Jaskolski has worked on a large number of community-based research and development projects, fostering sustainability, sustainable resource use, renewable energy, waste management and water conservation.



MARIAM DAWOUD

Mariam Dawoud is a project manager of the "Integrating Community Development and Student Learning through Rooftop Farming Research and Outreach" funded by the U.S. Forest Service International Programs. She holds a Master's degree from the Brandenburg University of Technology Cottbus-Senftenberg Germany in Heritage Conservation and Site Management. Dawoud has linked her educational background with environmental sustainability by carrying out research on environmental sustainability and education, heritage and environment sustainability, and community development in different community clusters in Egypt. Since joining the American University in Cairo in 2017, Dawoud has worked on different types of community based research and development projects, urban rooftop farming, waste management, water conservation, and sustainable resource use.



ABOUT THE CONTRIBUTORS:



ABDALLAH TAWFIC

Abdallah is an Architect, Environmentalist and Urban Farmer. He works at the German International Cooperation (GIZ) under the Participatory Infrastructure Project in Urban Areas (PIP) and he is also the cofounder of Urban Greens Egypt, a startup aiming to promote the concept of Urban Agriculture in Cairo. He is also a Consultant for the United States Forest Service (USFS) International Program, working to support urban forestry related projects implemented in Egypt and the MENA region. Abdallah is also a frequent writer for the online magazine "The Nature of Cities".



KRISTINA BELL

Kristina is a program manager with the U.S. Forest Service International Programs Office in Washington, D.C. She works on the Africa and Middle East team, managing programs in Egypt, Ethiopia and the West Bank. She focuses on community-based environmental development, and seeks to develop mutually beneficial partnerships across the region. Prior to joining the International Programs Office, she worked at the Forest Service headquarters office to help develop and implement a program around engaging youth and veterans in public lands conservation and stewardship. She has a Master's degree in Public Administration and a Bachelor's degree in Business Administration from Fordham University.



GRACE SWANSON

Grace is a program manager with the U.S. Forest Service International Programs Office, where she manages activities in Lebanon, Rwanda, and Kenya. Prior to joining the Forest Service in 2016, she resided in Amman, Jordan, where she worked for a local development agency, designing and implementing environmental, cultural heritage, and refugee support programs in rural areas. Grace holds a B.A. from Loyola University Chicago in International Studies, and is studying for her M.Sc. from the University of Birmingham in International Development (Conflict, Security, and Development).





Beyond Trees is a global network of conservation and stewardship organizations, government agencies, universities and research institutions, multilateral groups, private industry -- all working together to improve lives everywhere, but with a particular focus on communities in urban areas. Together with the US Forest Service International Programs, these member organizations from 90+ countries work on efforts around tree plantation, wildlife conservation, environmental awareness, equity, gender equality, rooftop farming, waste management, water conservation and youth and community engagement. The power of the Beyond Trees Network lies in collaborations that lead to a sharing of knowledge and resources, exponentially increasing the impact of each of the organizations.

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