

Urban Green Roofs

**What are the advantages of urban green roofs & walls?
What constitute the main challenges to implementing green roofs/walls and
how to overcome them?**

Expert Name:ZeinaKronfol

Landscape Architect & Consultant

Greener-ontheotherside



Short Profile:ZeinaKronfol has been practicing landscape architecture for more than ten years, working across the Middle east and Europe. Between 2010 and 2017, she co-founded two award winning landscape companies: Green Studios (a landscape technology company specialized in Green walls and roof gardens) and Greener-ontheotherside (a landscape architecture practice).

From 2010 till 2015, Zeina co-registered with her partners at Green Studios, a patent in a 'smart hydroponic skin' that won them The Endeavor Entrepreneur Award in 2014. With this technology, she has led on several iconic projects such as Beirut Terraces with Herzog & De Meuron, Banque du Liban roof Garden and the Dubai Municipality Facade. She also co-created the concept of Mutated landscapes with Pamela Haydamous where they showcased their installations at the Institut du Monde Arabe in Paris, Design Days in Dubai and Beirut Design Week.

Greener-OnTheOtherSide is her new co-founded practice in which she focuses on elevating nature and reconciling it with people through conscious interventions. Whether it's an artistic installation to stress on a certain topic in the field; a design strategy to a given situation or a traditional landscaping project, Greener-OnTheOtherSide's input aims at recreating a symbiosis between man and nature in both urban and rural contexts.

One of its first executed public projects, underpinning this approach is the Karantina play garden, granted the Lebanese Architects award for Public Spaces in February 2017.

Zeina has a bachelor's degree in Landscape Design and Eco-Management from the American University of Beirut (AUB), where she co-instructs landscape design courses when time permits

Expert Name: Bassel Basha

Agricultural Engineer,
technical expertise in Green Roofs



Short Profile: Graduated from AUB in 2011 as an agricultural engineer specialized in hydroponic technology. Shortly after my graduation I started my career in working with NGO's where we introduced the hydroponic technology to farmers around Lebanon. Then I became the Contracting Manager for a period of three years at Green Studios who are the leaders in Green Wall and Roof Garden Technology."



Definition / Benefits	Constraints / Challenges / Barriers
<p>✓ What is a green roof: Roof gardens are man-made green spaces on the topmost levels of industrial, commercial, and residential structures. They may be designed to grow produce, provide play space, give shade and shelter, or simply be there as a living, green area. There are virtually no design limits, provided the structure of the building caters for them.</p> <ul style="list-style-type: none">• Aesthetic• Production of fruits and vegetables <p>✓ History: The first known roof gardens are thought to be the Ziggurats of ancient Mesopotamia, the most famous of which is the Hanging Gardens of Babylon, one of the Seven Wonders of the Ancient World</p>	<p>✓ Disadvantages of Roof gardens:</p> <ul style="list-style-type: none">• Structural limitations – Some old buildings cannot withstand the additional weight on the roof.• Installation and maintenance costs are high.• Susceptible to damage and leakage – If NOT executed by professionals, despite applying green roof root barrier layer, some plant roots can penetrate the waterproof membrane and causing leaks in the roof, which in turn causes structural damage to the building

<ul style="list-style-type: none"> ✓ Why do we need roof gardens <ul style="list-style-type: none"> • Over population → increase in construction → less nature • Farms are located very far away → produce reaching us not fresh+ Plus high cost due to transportation. • Decreases pollution from cars and factories and filters air from dust • Increases space • Aesthetic ✓ Advantages of Roof gardens <ul style="list-style-type: none"> • Improve the Micro-climate by cooling the surrounding air, GR make a valuable contribution to improve the micro-climate especially in densely populated areas • Increase water retention Rain Water run-off is reduced and delayed, diminishing the stress on the sewer system. • Binds Dust and Toxic Particles • Improves Noise Protection • Provides Natural Biodiversity Habitats • Supports Recycling Reduces Renovation Costs • Reduces Energy Costs • Provides Additional Space • Fresh produce • Teaching new generation 	
Best Practice / Solutions / Tools	Resources / local Availability
<ul style="list-style-type: none"> ✓ Selection of proper type of roof garden to suit each project ✓ Perform all tests required to ensure longevity of the project ✓ Hiring experts to guarantee high standards ✓ Solutions by Type of roof garden: <ol style="list-style-type: none"> a. Extensive: <ol style="list-style-type: none"> i. Are ecological alternative to conventional surface protection such as gravel and pavers. ii. -are mostly inaccessible iii. -they are lightweight and have shallow built-up height. iv. -mainly mineral substrate in 	<ul style="list-style-type: none"> ✓ Certified installers of roof gardens ✓ Professional landscaping companies ✓ Professional water proofing companies ✓ Local specialists ✓ Local consultants

layers up to 12cm.

- v. -weight is approx. 50-150 kg/m²
- vi. -plants suitable for Extensive GR are drought tolerant and undemanding: such as Sedum species + herbs + some grasses.
- vii. -maintenance is limited to one or two inspections per year.
- viii. -supply of water and nutrients mostly by natural processes.

b. Semi-Extensive

- i. Are ecological alternative to conventional surface protection such as gravel and pavers.
- ii. -are mostly inaccessible
- iii. -they are lightweight and have shallow built-up height.
- iv. -mainly mineral substrate in layers up to 12cm.
- v. -weight is approx. 50-150 kg/m²
- vi. Allows more plant choices than extensive but still limited to small plants to shrubs
- vii. -maintenance is limited to one or two inspections per year.
- viii. -Irrigation is needed.

c. Intensive:

- i. Are easily compared to building a garden on a roof.
- ii. -are usually multi-functional and accessible.
- iii. -require more weight and system build-up depending
- iv. On plants selection.
- v. -substrates has higher amount of organic
- vi. material in layers >15cm
- vii. -weight is approx. >150 kg/m²
- viii. -plants vary from lawns,

perennials to

- ix. Shrubs and trees along with other landscape materials such as pergola, paving etc..
- x. -maintenance is regular depending on the chosen plants.
- xi. -require irrigation system and garden maintenance like mowing, fertilizing, weeding etc..