

Integration Of Vertical Agriculture and Farming Into Urban Homes

Saygin, M.

Robert College Science Society, President

Melisa Saygin

e-mail: saymel.18@robcollk12.tr

Abstract

Nowadays, the idea of embedding oneself into the city and business life, and living with the hopes of escaping from this life when the time of retiring comes, unfortunately, remarkably increased (Stress). People see working life and nature in the two opposite ends of the spectrum of life; humankind must propel in terms of science, technology, and art while finding serenity in nature, both for the societies' progression and people's well-being. Thus, agriculture and farming should be integrated into the daily lives of working people in a way that they don't need to waste time raveling long distances to get away from the city. Nature shall be unified with business life that these people can involve in nature related occupations such as feeding animals, watering plants, and getting products from the nature such as receiving eggs and tomatoes. For such an integration, small vertical farming units can be designed to be put on the balcony of these, preferably working, people; various levels of the vertical agriculture unit with many levels can include both plants of different kinds, birds of Galliformes such as quails, and aquariums so that one can get a glimpse of nature while eating natural products.

Keywords: Urban, Agriculture, Farming, Combination, Nature

Introduction

Because everyone has different sizes of homes and balconies, each vertical agriculture and farming unit for urban life will be designed particularly to one's condition and needs. Throughout the paper, the vertical agriculture and farming unit will be referred to as integrated nature unit INU. It should be noted that a major point is to "make use of as much of space as possible" (Frazier). Some example sizes, compartments, levels, materials, and natural products to be taken care of will be discussed in the paper. The purpose is for, especially, people busy with the city and working life to feel as if they live in a natural environment, which will be made possible by INU. So, they can get daily fresh food, and not see the nature at the opposite end of their lives, and that they won't get depressed easily, for they will satisfy their evolutionary need of natural connection. Touching soil, not spending a lot of time to visit far away farms, and without wasting a

lot of money to acquire a land, people will have relatively more balanced lives: something which tremendously would contribute to both their health, and the quality of work they do, while familiarizing urban dwellers with the ways of nature.

Fabrication Process

We can start the explanation of INU, by considering the most rudimentary example, then providing moderate examples and concluding with a complex design. INU can be fabricated even for a one meter square of area. If we want to insert three levels of plants top of a one meter square area, we need a height difference of 40 cm for each plant's soil, and need 20 cm for each plant's vertical growing space, this will mean the ceiling of the balcony should be at least 1 meters and 80 centimeters, which most ceiling throughout the world are. Such a rudimentary one-meter-square-base and one-meter-eighty-centimeters-height, only-plant, three-levels INU can be seen in figure one. To not exceed the ceiling limits of an average balcony, with these example heights, three types of vegetables or fruits can be chosen to be planted which doesn't exceed the limit of 20 centimeters of above-soil-growth, such as strawberries, carrots, and potatoes. If one lives in a really cold environment with no shielded balcony, the INU can be covered up with mica, and with accompanying sliding opening doors in each level of plants.

An example vertical unit consisting of only plant species

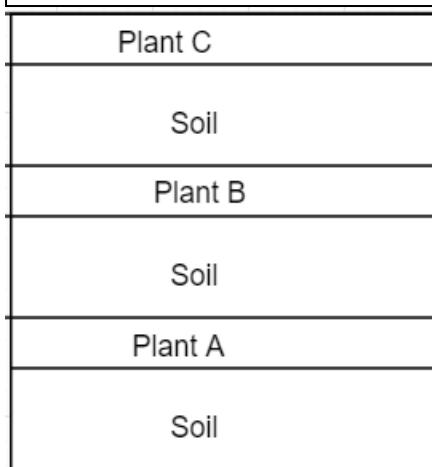


Figure 1

For better growth of the plants in areas which are exposed to less amount of sunlight than normal, or are cold, particular plant growth stimulating and heating, low-cost laser lights can be used; these strips of plant growth stimulating lasers can be easily attached, or even glued to the mica shield –mica sides and surfaces- of INU.

Without even increasing the area our original one meter square of base, a different combination can be made, including an aquarium level, space for multiple quails, and one long plant growth level for plants such as tomatoes and eggplants. Aquarium, if at the most lower level, would crash; therefore an aquarium with a height of 30 centimeters and base of, as we know, one meter square will be positioned at the top of INU. For this unit, we will position a vegetable or fruit with considerable height, that is about 50 centimeters; hence, the soil length of this plant will be about 40 cm. At the lowermost level, four to six quails can be positioned. They already have particular smaller units, which allows daily eggs to roll down an inclined plane, which will allow the people having the unit to also benefit from fresh eggs. It should also be noted that, in terms of protein, a single quail egg has 9 times more protein than a classical chicken egg (Tremblay). INU users will also experience the joy of getting healthier and raising stronger children with the aid of immensely nurturing eggs. If customers want to experience the birth of a baby quail, they might as well keep some of the eggs near the quails for them to hatch in the future. The reason that quails are particularly advised to be used is they don't get taller, and because they don't fly and jump, they are much less likely to get depressed in a one meter square of area compared to, for instance chickens. As for aquarium, filters can be set up as usual, yet everything that doesn't touch the ground should be attached to the mica covering INU. Cable extensions can be used for filters to get electric. With this model, which can be seen in Figure 2, city people would have a farm with serenity and organic goods just within a meter square, costing them approximately 1000 times less compared to acquiring a small land. If a mica is used to cover all sides of the system, there will be a particular benefit. Once someone waters them, a water cycle will be initiated. Water will eventually be used or evaporated; but the amount evaporated will condense and that re-satisfy the water need of the plant. Subsequently, there will be less waste of water compared to the water usage in lands, farms, and villages: places where we all consider within nature, yet INU will be more nature-friendly, at least in terms of preserving our waters.

An example vertical unit consisting of plant, aquarium, and quail levels

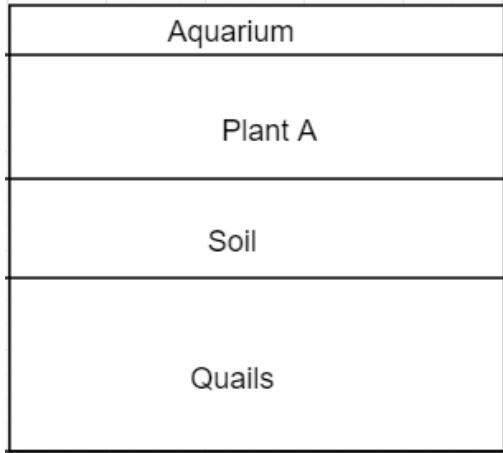


Figure 2

For INU to be durable, suggested material to make the skeleton of the unit is iron. As specified before, different shapes can be designed: the unit doesn't need to look like a rectangular prism or cube, it can, for instance, also be a rectangular based pyramid. One such example of a iron rectangular based pyramid INU skeleton, that is, without the plants, soil, birds, and the necessary strongboxes for soil, can be seen in Figure 3.

A basic skeleton modeling for an INU in the shape of rectangular pyramid, made with iron



Conclusion

As Occam's *Figure 3* refends, simpler the method or answer, better it is. Balancing the lives of hundreds of millions of stressed workers with the use of diminutive space, time and money is what everyone who aspires to retire actually looks for: a part from nature to stay with them at all times, not a short vacation or a tremendously demanding field. Different orientations can be made, and according to the wishes of the customers, plants, birds, and fishes can be put in the system. Fishes are for the purpose of aesthetics, whereas one can take advantage of vegetables and quail eggs by consuming them. Hence,

especially city people will embrace work and nature at the same time, rather than seeing these as enemies of each other (Stress); the amount people benefit to society will increase; people will have a healthier and balanced life, and will gain natural work experience, all with a considerably low cost which will contribute to world water resources.

References

Frazier, Ian. "The Vertical Farm" *The New Yorker*. 25 Mar. 2017.

"Stress Is One Reason People Retire" Squared Away. Boston College Center For Retirement Research, 28 Apr. 2016. Web. 24 Mar. 2017.

Tremblay, Sylvie. "Quail Egg Nutrition." *LIVESTRONG.COM*. LIVESTRONG, 03 Feb. 2014. Web. 24 Mar. 2017.