# UNIT 3 – Clean Technologies

## Reading 1

**Skills**:

- Details
- Identify referents
- Language function
- Vocabulary in context
- Understand negative facts

**Getting started**: What is a skyscraper? Do you know any famous one? Are skyscrapers a solution to overpopulated cities?

### FARMSCRAPERS

Half of earth's population is living in overcrowded cities. According to certain projections, this number will increase and come up to 70% about fifty years from now. A challenge that seems to be hard to **bear**. The challenge for big cities around the globe is to be able to provide for seven billion citizens without over-exploiting natural resources.

One answer to this future problem is the concept of "vertical farming", also referred to as "agricultural towers", an idea that calls for the use of advanced technologies. In principle, most of **these** already exist. The goal is to minimize the distance between end-consumers and production sites by means of urban agriculture. Production of botanical and animal products can happen within the cities, saving time and money by reducing transport costs. Different levels, one on top the other, offer more space compared to traditional agricultural areas. Crops can be planted constantly without rotation as the environment creates ideal conditions of irrigation, fertilization and lighting.

Sky Greens, located in Singapore, is the world's first commercial vertical farm, and has been referred to as the "farm of the future". This productive and efficient indoor organic farmscraper has towers that are three-**stories** tall, around 9 meters, and grows green leafy vegetables in **its** location. The company estimates their production is more than a ton of produce per day.

The multi-layered vegetable tower rotates very slowly, taking some eight hours to complete a full circle. As the plant travels to the top, it absorbs ample sunlight and when it comes back down it is watered from a tray that is fed by the hydraulic system that drives the rotation of the tower. Rotation is powered by a unique, patented, hydraulic, water-driven system which utilizes the momentum of flowing water and gravity to rotate the plant tanks, and it only requires 40W of electricity to power one of these towers.

This minimal use of electricity is due to its remarkably efficient design, which uses 90 per cent less water than traditional farming methods by **employing** a flooding method rather than a sprinkler system. Only half a liter of water is required to rotate the 1.7-ton vertical structure. The water is contained in an enclosed underground reservoir system and is recycled and reused.

Urban farming is proving to be an exciting new frontier that is still in its infancy, but as the methodology evolves and lighting costs **drop**, growers will see a marked increase in efficiency and crop yield. **For instance**, LED lights were only 20 per cent efficient a few years ago but are now operating at a 60 per cent efficiency level. With the utilization of clean technology like solar panels and geothermal energy, operating costs for urban farmers will only decrease in the coming years.

**Adapted from https://www.maximumyield.com/farmscrapers-vertical-gardening-that-combines-the-past-and-future-of-agriculture/2/2981*

**Answer the following questions:**

1. What is stated in paragraph 1?
   a. Overcrowded cities aren't likely to survive.
   b. 50% of the people in the planet live in very big cities.
   c. BY 2070, the earth's population will have grown by 70%.
   d. In the future, seven billion citizens won't have any food to consume.

2. The word **bear** in paragraph 1 can be replaced with
   a. responsibility
   b. heavy animal
   c. deal with
   d. show

3. The word **these** in paragraph 2 refers to
   a. idea
   b. towers
   c. concept
   d. technologies

4. According to paragraph 2, what is NOT mentioned about vertical farming?
   a. People won't have to travel long journeys to sell or obtain food.
   b. Compared to conventional agriculture, there is more space for crops in vertical farming.
   c. The same crops can't be planted in succession, so new crops must be planted the next time.
   d. The cost of transporting goods will decrease.

5. The word **stories** in paragraph 3 is closest in meaning to
   a. floors
   b. reports
   c. versions
   d. narrations

6. The word its in paragraph 3 refers to
   a. future
   b. towers
   c. vegetables
   d. farmscraper

7. What is true about the farmscraper farming system described in paragraphs 4 and 5? (**Choose 2 options**)
   a. Not so much energy is used to operate this system.
   b. Gas must be used to rotate the structure.
   c. Only little water is really used.
   d. It has a light structure.

8. The word **employing** in paragraph 5 is closest in meaning to
   a. working
   b. using
   c. hiring
   d. exploiting

9. The word **drop** in paragraph 6 is closest in meaning to
   a. rain
   b. stop
   c. reduce
   d. abandon

10. What is the function of the phrase **for instance** in paragraph 6?
    a. Express example
    b. Express purpose
    c. Express opinion
    d. Express contrast

## What do you think?

What are the benefits of urban agriculture? Do you think it also has disadvantages?