

Unit Two

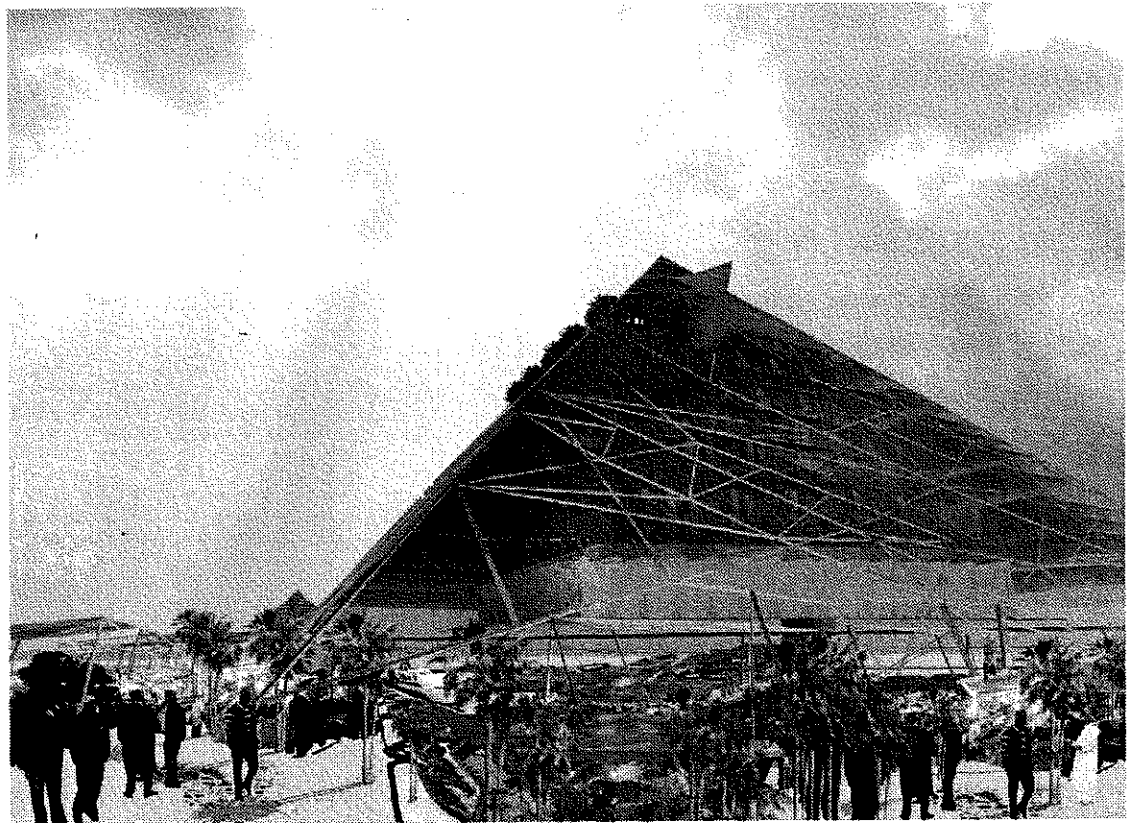
Pyramid Farm by Eric Ellingsen and Dickson Despommier

I. Reading Preview

Look at the picture below and read the title of the article! Based on the two, answer the questions below.

- 1. What do you think "vertical farming" is?*
- 2. What do you believe would be the ecological advantages of vertical farming?*
- 3. In what types of locations would it be most beneficial to vertically farm?*

<http://www.verticalfarm.com/designs.aspx>



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II. Vocabulary Preview

A. The following words are concerned with agriculture. Define or explain the terms below.

1. vertical farming _____
2. horizontal farming _____
3. urban farming _____
4. hothouses _____
5. produce (noun) _____
6. cutting edge technologies _____
7. sustainable production _____
8. food-bearing plants _____

B. Join words from column A that can be combined with words from Column B.

There may be more than one answer for each one.

Column A

1. urban
2. demographic
3. farming
4. laid
5. sustainable
6. against
7. protracted
8. take their
9. environmentally
10. year round
11. impending

Column B

- a. crop production
Example: year round crop production
- b. practices
- c. toll
- d. controlled
- e. drought
- f. centers
- g. waste
- h. trends
- i. disaster
- j. the elements
- k. production

C. Match words from column A with words that have **opposite** meaning in Column B.

Column A

1. impending
2. horizontal
3. urgent
4. disposal
5. withering (dying)
6. to despoil
7. to take for granted
8. to gain
9. severe
10. urban

Column B

- a. to sacrifice
- b. vertical
- c. to appreciate
- d. far-off
- e. rural
- f. renewal
- g. to give life to
- h. verdant
- i. light
- j. unimportant

III. Reading Passage**Vertical Farming**

by Dickson Despommier

Part I**The Problem**

- (1) By the year 2050, nearly 80% of the earth's population will reside in urban centers. Applying the most conservative estimates to current demographic trends, the human population will increase by about 3 billion people during the interim. An
- 5 estimated 109 hectares of new land (about 20% more land than is represented by the country of Brazil) will be needed to grow enough food to feed them, if traditional farming practices continue as they are practiced today. At present, throughout the world, over 80% of the land that is suitable for raising crops is in use (sources: FAO

and NASA). Historically, some 15% of that has been laid waste by poor
10 management practices. What can be done to avoid this impending disaster?

A Potential Solution: Farm Vertically

(2) The concept of indoor farming is not new, since hothouse production of
tomatoes, a wide variety of herbs, and other produce has been in vogue for some
15 time. What is new is the urgent need to scale up this technology to accommodate
another 3 billion people. An entirely new approach to indoor farming must be
invented, employing cutting edge technologies. The Vertical Farm must be efficient
(cheap to construct and safe to operate). Vertical farms, many stories high, will be
situated in the heart of the world's urban centers. If successfully implemented, they
20 offer the promise of urban renewal, sustainable production of a safe and varied food
supply (year-round crop production), and the eventual repair of ecosystems that
have been sacrificed for horizontal farming.

(3) It took humans 10,000 years to learn how to grow most of the crops we now
take for granted. Along the way, we despoiled most of the land we worked, often
25 turning verdant, natural ecozones into semi-arid deserts. Within that same time
frame, we evolved into an urban species, in which 60% of the human population now
lives vertically in cities. This means that, for the majority, we humans are protected
against the elements, yet we subject our food-bearing plants to the rigors of the
great outdoors and can do no more than hope for a good weather year. However,
30 more often than not now, due to a rapidly changing climate regime, that is not what
follows. Massive floods, protracted droughts, class 4-5 hurricanes, and severe
monsoons take their toll each year, destroying millions of tons of valuable crops.
Don't our harvestable plants deserve the same level of comfort and protection that
we now enjoy? The time is at hand for us to learn how to safely grow our food inside
35 environmentally controlled multistory buildings within urban centers. If we do not,
then in just another 50 years, the next 3 billion people will surely go hungry, and the
world will become a much more unpleasant place in which to live.

Part II Advantages of Vertical Farming

1. Year-round crop production; 1 indoor acre is equivalent to 4-6 outdoor acres or more, depending upon the crop (e.g., strawberries: 1 indoor acre = 30 outdoor acres)
2. No weather-related crop failures due to droughts, floods, pests
3. All VF food is grown organically: no herbicides, pesticides, or fertilizers
4. VF returns farmland to nature, restoring ecosystem functions and services
5. VF dramatically reduces fossil fuel use (no tractors, plows, shipping.)
6. VF converts abandoned urban properties into food production centers
- 7.. VF creates sustainable environments for urban centers
8. VF creates new employment opportunities
9. We cannot go to the moon, Mars, or beyond without first learning to farm indoors on earths
10. VF could reduce the incidence of armed conflict over natural resources, such as water and land for agriculture

(This is an abridged list of the original)

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From the site: <http://www.verticalfarm.com/>

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IV. Reading Questions

Paragraph 1

1. "By the year 2050" means:
 - a. anytime before or on January 1, 2050
 - b. anytime in the year 2050.
 - c. anytime after the year 2050
 - d. on January 1, 2050 only

2. By the year 2050, the earth's population will

- a. increase conservatively.
- b. gain at least 3 billion more people.
- c. decrease by 3 billion people.
- d. consist of 3 billion people.

3. **Circle true or false.**

It is predicted that by 2050 the world will need to develop more farmland to feed the additional world population.

Justify with a quote from the text: _____

4. **Circle true or false.**

In the past, 15% of the land that was suitable for raising crops had been spoiled by poor management practices.

Justify with a quote from the text: _____

5. What is the **impending disaster** referred to on line 10? (The answer is **inferred**. Do not write more than one sentence)

Paragraph 2

6. What idea is exemplified by **tomatoes and herbs**?

7. What does "**this technology**" refer to on line 14?

8. Which statements are made about successful future vertical farms?

(There is more than one answer; check the correct statements.)

- a. They must be costly to build and operate. _____
- b. They will be located in the center of rural districts. _____
- c. They will offer a variety of foods all year round. _____
- d. They will help revitalize the cities. _____
- e. They will solve ecological problems brought on by
conventional farming _____

Paragraph 3

9. The author says that over a 10,000 year period **3 different** processes occurred. What are they?

- 1. _____
- 2. _____
- 3. _____

10. What does "**this means**" on line 27 refer to?

11. In lines 27—28 there is a **contrast**. State the 2 sides of the contrast and the contrast marker used.

- a. _____
- b. _____

contrast marker _____

12. On line 29 what does the word "**however**" indicate?

- a. comparison
- b. result
- c. example

d. contrast

Support your answer from the text!

13. What does "**that**" on line 38 refer to?

14. The expression "**due to**" is a marker that indicates:

- a. contrast
- b. comparison
- c. cause
- d. example

15. What is(are) the effect(s) of a rapidly changing climate regime (line 29)?

16. Circle true or false

The author believes that it is inevitable that billions of people will certainly go hungry in another 50 years.

Justify with a quote from the text: _____

Part II

17. Organize the advantages of vertical farming according to the following categories. Some of the advantages can be listed under more than one category. The first one has been done for you.

Increase in Food Production

1. *Year-round production...*

Environmentally friendly methods**Ecological Restoration****Economic Gains****Social Effects****Scientific Advancement**

V. Vocabulary Focus

A. Fill in the chart below with the correct form of the word family.

<u>Noun</u>	<u>Verb</u>	<u>Adjective</u>	<u>Adverb</u>
residence resident	Reside	residential	
current currency		current	currently
Practice	Practice	practical	practically
variety variation variant variable	Vary	various	variously
Accommodation	accommodate	accommodative accommodating	
Sustenance	sustain	sustainable	
employment employee employer	employ	employable	
Situation	situate		
Avoidance	avoid	avoidable	
Reduction	reduce	reduced	

B. Fill in the blanks with words from the word family chart.

- (reside) The family _____ in the city. They also have a _____ in the country. The city is divided into industrial areas and _____ areas.
- (current) It is difficult swimming in the river because of the strong _____. The author's _____ book has not been as successful as the previous ones. The author is _____ working on

a new book. The electric _____ has been shut off. When going abroad, people often exchange one _____ for another.

3. (practice) The tennis player must _____ many hours before a match. The gambler _____ lost all of his money playing cards one night. Mary is economical and _____. The lawyer has just opened his own _____. Different religions have different _____.
4. (vary) In algebra problems, X is a _____. The supermarket does not have one or two types of cereal, it has a _____ of cereals. The bacterial culture contains a _____ of the bacteria *e.coli*. Jack's grades are consistent; they do not _____. The two songs are very similar; one is a _____ of the other. _____ students have chosen to take the drama class.
5. (accommodate) The hotel has different levels of _____. The hostess was kind and _____ to her guests. The teaching staff made great efforts to _____ students with special needs.
6. (sustain) The farm is able to _____ all the needs of the farmer. The farm provides all the _____ that its residents need. The farmer's goal is for her farm to be _____.
7. (employ) The owner of the company is considered to be a fair _____. His _____ enjoy working for him. The youngsters had trouble finding _____ during their summer vacation. Jack is not _____; he argues with everyone and does not do what is required of him. No one will _____ Jack.

8. (situation) Where is the university that you attend _____.
Everyone talks about the _____, but no one has a solution.
9. (avoid) Jill does not like to argue; she _____ situations that
cause conflict. Behavioral psychologists use _____ as a technique
to help people solve some of their problems. Some accidents are
_____; others are not.
10. (reduce) The customer asked for a _____ of his bill. The
salesperson _____ some of the money that he had to pay.
The _____ bill was paid immediately.

C. Fill in the blanks with a word from the word family chart. Use a word family only once.

1. The medicine was important to take because it _____ the patient's health.
2. The _____ tried to _____ all of his employees' needs. *(2 different word families)*
3. The dieter was able to _____ his weight when he included exercise into his plan.
4. Sally could not _____ meeting Jack. It was as if it were predetermined.
5. Jack _____ is a _____ of Tel Aviv. He intends to move to Haifa soon. *(2 different word families)*
6. Weather is governed by several different _____.
7. What religion do the people of Japan _____?
8. The observation tower is _____ in the forest; rangers sit there watching out for forest fires.

VI. Grammar Focus

A. Present Simple Progressive Active and Passive

This tense is used for actions that are happening at the time of speaking or actions that are in the middle of occurring. It can also be used for the immediate future. *Ex. Jack is sitting and eating at the moment.*

We are running in a marathon tomorrow.

My house is being painted.

Active

Present continuous	Is/are	Ving	is running, is doing is dropping
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Passive

Present continuous	is, are	being	V3	is being done, are being dropped,
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Fill in the blanks with the correct form of the verb. Choose from the present simple or the progressive (active or passive)

Vertical Farming

Vertical farming is a relatively new concept, and some who _____(*concern*) about the environment _____(*think*) about establishing such farms. Some ecologists _____(*think*) that vertical farming is a solution to some of the world's food problem. Vertical farming _____(*allow*) for food production regardless of weather conditions. It also _____(*eliminate*) some pollution because pesticides and other poisonous substances _____(*not need*) to grow crops. The vertical farm concept is not without its critics. Some critics _____(*say*) that the land in cities is much too expensive for farming

since farmers _____(be) not able to compete with bankers and industrialists for property in the cities. Some _____(call) vertical farming a nice idea, but they _____(say) that it is not feasible. Vertical farming currently _____(plan) for a 32 story building in Seattle, Washington. Once a farm _____(establish), the feasibility of the concept will be known.

B. Past Simple and Past Progressive

1. Past Simple Tense

If you need a review of the past simple tense. Go to the following sites:

<http://web2.uvcs.uvic.ca/elc/studyzone/330/grammar/pasted.htm>

<http://web2.uvcs.uvic.ca/elc/studyzone/330/grammar/irpast.htm>

<http://web2.uvcs.uvic.ca/elc/studyzone/330/grammar/pastng.htm>

If you want a list of irregular verbs, go to this site:

<http://www2.gsu.edu/~wwwesl/egw/verbs.htm>

I, you, he, she, it, we, they	V2 (looked, talked, told, went)
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Negative – did not + V1 – did not go or didn't go

2. Past Progressive Tense

Structure of Active Voice			Example
I, he, she, it	Was	Ving	I was telling
We, you, they	Were	Ving	They were telling

Negative – was not + ving

I was not telling

Were not +ving

They were not telling

Structure of Past Progressive Passive Voice

I, it, she, he,	Was	being	V3 (told, depended)
we, you, they	Were	being	V3 (told, depended)

Negative - was +not being +v3

was not being done

were+ not being +v3

were not being looked at

Use of Past Progressive

1. For an action that continued for some time in the past and the exact time and duration were not stated.

Example: *The wind was blowing.* Active

We were singing.

The house was being repaired. Passive

2. For an action that began before a certain point in the simple past and continued after that point.

Example: *Jack was talking when I arrived.* Active

The lecturer was teaching when Jack got a telephone message. Active

The food was being prepared when the electricity was shut off. Passive

The news was being broadcasted when we heard a strange sound.

Passive/Active

3. For two or more actions that were going on at the same time or part of the same time in the past.

Example: *We were dancing while they were singing.* Active

We were taking notes while the lecturer was speaking. Active

The movie was being screened while a terrible storm was going on outside,

Active/Passive

Fill in the blanks below with the correct form of the past simple, past progressive, present simple, or present progressive.

a. Vertically farming _____(develop) by Dr. Dickson Despommier. Vertically farming _____(be) a system of farming whereby food _____(grow) in the city. It _____(also, call) urban farming. The concept _____(deal) with building farms in the city, thereby drastically reducing the distance food _____(transport). Some designs of "farm-skyscrapers" _____(publish) in certain American journals last year.

b. We _____(read) about various agricultural methods while we _____(surf) the Internet last night. We _____(find) many sites that _____(describe) some of the most modern agricultural technology that _____(exist) today. We were interested in reading about Vertical Farming, so we _____(look up) Dickson Despommier, who _____(originate) the idea. We _____(find) articles in the New York Times and Time Magazine that _____(discuss) his idea. His idea _____(be) controversial, but fascinating.

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