

PiXL Independence:

Geography – Student Booklet

KS4

Ecosystems

Contents:

- I. Multiple Choice Questions – 10 credits
- II. Short Answer Questions – 10 credits each
- III. Annotation – 30 credits each
- IV. Suggested Reading – 50 credits each
- V. Long Answer Questions – 100 credits and 20 for marking your own
- VI. Synoptic Thinking – 30 credits each

I. Multiple Choice Questions

1. Which of the following is an abiotic component of an ecosystem?
 - a. Insects
 - b. Birds
 - c. Soil
 - d. Flowers

2. Which of the following terms refers to the links between parts of an ecosystem?
 - a. Biotic Components
 - b. Interrelationships
 - c. Decomposer
 - d. Producers

3. An organism which converts sunlight into energy is known as what?
 - a. A producer
 - b. A consumer
 - c. A decomposer
 - d. A top consumer

4. Which of the following ecosystems would be considered a Global Ecosystem (Biome)
 - a. Pond
 - b. Hedgerow
 - c. Woodland
 - d. Rainforest

5. What is the correct name for an organism which breaks down dead plant and animal material and returns the nutrients into the soil to be used again?
 - a. A producer
 - b. A consumer
 - c. A decomposer
 - d. A top consumer

6. What is the correct name for an organism which gets its energy from consuming the producers?
- A producer
 - A consumer
 - A decomposer
 - A top consumer
7. Which is the correct description of a food web?
- A complex diagram showing all the links between producers and consumers
 - A diagram showing the direct links between producers and consumers
 - A diagram showing the cycle where dead plants and animals are recycled into foods that are used by other plants and animals to help with growth
 - A diagram showing the layers of the rainforest
8. Which is the correct description of a food chain?
- A complex diagram showing all the links between producers and consumers
 - A diagram showing the direct links between producers and consumers
 - A diagram showing the cycle where dead plants and animals are recycled into foods that are used by other plants and animals to help with growth
 - A diagram showing the layers of the rainforest
9. Which is the correct description of a nutrient cycle diagram?
- A complex diagram showing all the links between producers and consumers
 - A diagram showing the direct links between producers and consumers
 - A diagram showing the cycle where dead plants and animals are recycled into foods that are used by other plants and animals to help with growth
 - A diagram showing the layers of the rainforest
10. Which of the following ecosystems would be considered a Small-Scale Ecosystem?
- A Tropical Rainforest
 - A Desert
 - The Savannah
 - A woodland

11. Choose the statement from the list below which is false about Hot Desert Ecosystems

- a. They are roughly found 30⁰ North and South of the equator
- b. They are found in areas of high air pressure
- c. There is little cloud cover
- d. They have high biodiversity

12. Choose the statement from the list below which is false about Tropical Rainforest Ecosystems:

- a. They are mainly found surrounding the equator
- b. They are found in areas of high air pressure
- c. They have high annual rainfall totals
- d. They have high biodiversity

13. Which of the following Global Ecosystems is found across Northern Canada, Northern America and Northern Europe?

- a. Tropical Rainforest
- b. Savannah
- c. Tundra
- d. Hot Deserts

14. Which description best describes the Savannah Global Ecosystem?

- a. Cold and windy all year round
- b. Hot all year round with a clear wet and dry season
- c. Hot and wet all year round
- d. Mild winters and warm summers

15. Which of the following statements describes areas of low air pressure?

- a. Air is descending so there are few clouds and little rain
- b. Air is descending so there are many clouds and a lot of rain
- c. Air is rising so there are few clouds and little rain
- d. Air is rising so there are many clouds and a lot of rain

16. Which of the following statements describes areas of high air pressure?

- a. Air is descending so there are few clouds and little rain
- b. Air is descending so there are many clouds and a lot of rain
- c. Air is rising so there are few clouds and little rain
- d. Air is rising so there are many clouds and a lot of rain

17. Vegetation in the rainforest is adapted to the climate. Which of the following adaptations allows trees to get rid of excess rainwater to avoid breakage?

- a. Large leaves
- b. Buttress roots
- c. Drip-tip leaves
- d. Green leaves

18. Vegetation in the rainforest is adapted to the climate. Which of the following adaptations allows trees to support their large weight and gain as many nutrients from the soil as possible?

- a. Large leaves
- b. Buttress roots
- c. Drip-tip leaves
- d. Green leaves

19. Which of the following is NOT a cause of deforestation in the rainforest?

- a. Soil erosion
- b. Mineral extraction
- c. Population pressure
- d. Logging

20. Which of the following is NOT an effect of deforestation in the rainforest?

- a. Soil erosion
- b. Mineral extraction
- c. Loss of oxygen
- d. Loss of animal's habitats

21. The practice of protecting the rainforest by only cutting down certain trees and allowing others to stand is known as....?
- Nature Reserves
 - International Agreements
 - Selective Logging
 - Conservation Swaps
22. What is the name for the type of tourism where a small number of people can visit an area of rainforest while protecting it, and this gives jobs to local people?
- Economic Tourism
 - Cultural Tourism
 - Environmental Tourism
 - Ecotourism
23. To work out the annual temperature range of an ecosystem you need to.....
- Add all the month's temperatures together
 - Subtract the lowest temperature from the highest temperature
 - Add the lowest temperature to the highest temperature
 - Add all the temperatures together and divide them by the number of months
24. Which term below is the process by which fertile land becomes desert, typically as a result of drought, deforestation, or inappropriate agriculture?
- Deserting
 - Desertion
 - Desertification
 - Desertication
25. Hot Deserts have a large diurnal temperature range. What does this mean?
- They have a large difference between the temperature across the whole 24-hour day
 - There is very little difference between the temperature across the whole 24-hour day
 - There is a lot of rainfall all day
 - There is very little rainfall all day

II. Short Answer Questions

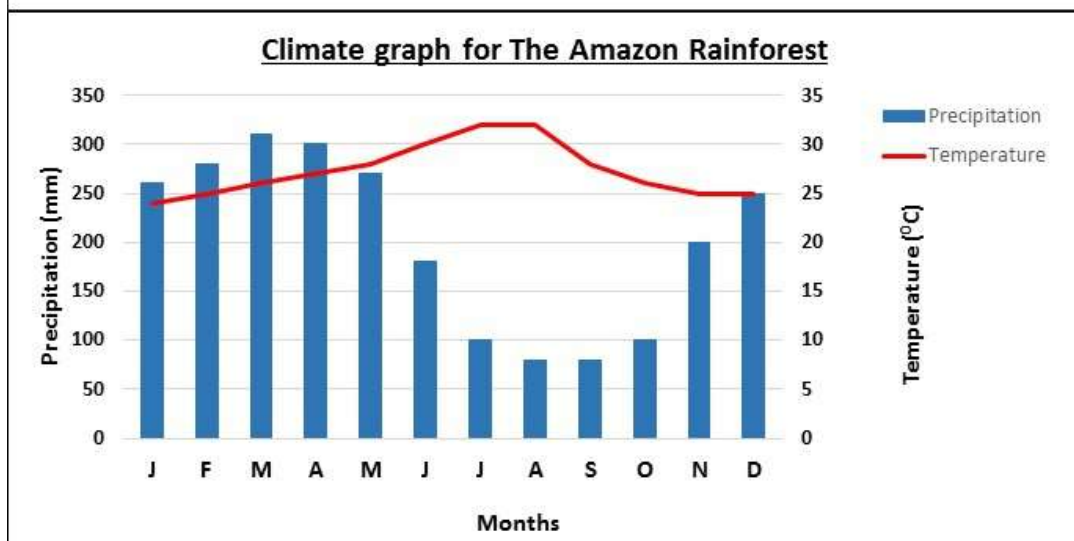
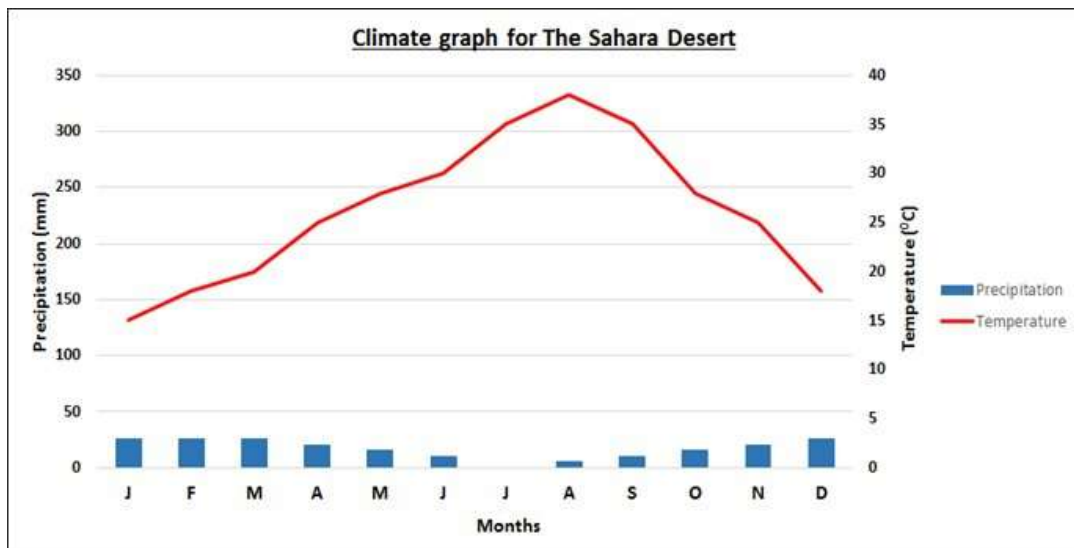
1. How would you define the term “ecosystem”?
2. Why are ecosystems so vulnerable to any small changes?
3. What are the main global changes which can influence ecosystems?
4. Why could drought have a huge impact on a small-scale pond ecosystem?
5. Why are Tropical Rainforests found surrounding the equator?
6. What changes could occur to break a rainforest’s nutrient cycle?
7. What are the main characteristics of a Hot Desert Ecosystem?
8. What are epiphytes and how do they survive in a Tropical Rainforest?
9. How are monkeys adapted to live in a Tropical Rainforest?
10. How is climate linked to the location of Global Biomes?
11. What are decomposers and what is their role in an ecosystem?
12. What are producers and what is their role in an ecosystem?
13. How do consumers get their energy in an ecosystem?
14. What is the meaning of the term “Global Atmospheric Circulation”?
15. Why do trees in a rainforest grow so tall without branches up the length of their trunk?
16. How many layers are there in a rainforest and what are they called?
17. Why are Hot Deserts located where they are on the globe?
18. What challenges do people living in Hot Deserts or Cold Environments face?
19. What opportunities are there for people living in Hot Deserts or Cold Environments?
20. Why are ecosystem so valuable for humans?

21. What does the term “biodiversity” mean?
22. Can you name 3 effects of deforestation on Tropical Rainforests?
23. In what ways is soil affected by desertification?
24. Can you make a list of the 5 key causes of deforestation in a location you have studied?
25. Why are there very few nutrients in the soil in a Tropical Rainforest?

III. Annotation

1. Annotate the following climate graphs to show

- The highest and lowest temperatures in each ecosystem
- The calculated temperature range for each ecosystem
- The highest and lowest precipitation in each ecosystem
- The calculated total annual precipitation for each ecosystem
- The major differences between the two ecosystems
- The major similarities between the two ecosystems



2. Annotate the photographs of an Ecotourism Lodge in the Kenyan Savannah to show the following:
- Characteristics of the vegetation
 - Ecotourism features of the resort (e.g. features which protect nature, fit in with the environment and do not hinder local people)



3. Highlight and annotate the following table as follows:
 - Highlight areas which have a *continual decrease* in forest cover between 1990 and 2010
 - Highlight areas in a different colour which have a *continual increase* in forest cover between 1990 and 2010
 - Highlight areas in a third colour which have a *change in their trend* over the three time periods
 - Now annotate any trends or patterns you can infer from the table

Total Forest Cover per World Region 1990-2010

(Source of data: Compiled by Earth Policy Institute from UN Food and Agriculture Organisation)

	1990	2000	2010
	<i>Data given in million hectares</i>		
Africa	749	709	674
Asia	576	570	593
Europe	984	998	1005
North and Central America	708	705	705
Oceania	199	198	191
South America	946	904	864

IV. Suggested Reading

1. Why is it so important to conserve the planet's biodiversity?
<http://www.the-scientist.com/?articles.view/articleNo/31236/title/Conserving-Our-Shared-Heritage/>
2. How is climate change affecting Global Ecosystems (Biomes)?
http://www.heraldextra.com/news/community/climate-change-forces-biome-changes/article_26b660b7-b04b-5baa-8d76-634a02a6610f.html
3. Why are decomposers so important in an ecosystem?
<https://www.sciencenewsforstudents.org/article/recycling-dead>
4. Should we boycott products with Palm Oil to reduce deforestation in the rainforest?
<http://blogs.wwf.org.uk/blog/green-sustainable-living/green-sustainable-living-food/palm-reading-should-we-buy-or-boycott-products-containing-palm-oil/>
5. Is selective logging really a good idea to protect the rainforest?
<http://news.stanford.edu/news/2005/october26/select-102605.html>
6. How is desertification affecting sub-Saharan Africa?
<http://www.bbc.co.uk/news/world-africa-34790661>
7. How are a variety of animals and vegetation adapted to the Tropical Rainforest?
<https://sciencing.com/adaptations-animals-tropical-rainforest-6862950.html>
8. What opportunities are there in the Thar Desert for energy production?
https://www.carbonneutral.com/images/uploads/projects/Thar%20Desert%20Wind%20Project_VCS.pdf
9. Describe the characteristics of a small-scale pond ecosystem.
<http://www.thewaterpage.com/pond-ecosystem.htm>
10. Outline the causes of deforestation in Malaysia
<http://homeguides.sfgate.com/major-reasons-deforestation-malaysia-78510.html>

V. Long Answer Questions

You should attempt to answer the longer questions on the following page using the following tips to help you with each set of command words:

Do you agree with this statement? Justify your reasons

- Read the statement
- Come up with at least two reasons you could agree with the statement and at least two reasons you could disagree
- Now find some evidence to back up these reasons
- Now write the answer using the following structure
 - Reasons you agree, reasons you disagree, overall conclusion of your reasoning

Compare

- Consider what is similar about the two things you have been asked to compare
- Consider what is different about the two things you have been asked to compare
- Now write your answer using the following structure
 - Similarities, differences, overall summary

Assess the extent to which/ To what extent

- Read the statement after “Assess the extent to which/ To what extent”
- Decide where you sit on a sliding scale- do you totally agree with the statement or totally disagree? (you are best to sit somewhere in the middle!)
- Consider your reasons for agreeing or disagreeing
- Now find some evidence to back up the reasons you have come up with
- Now write the answer using the following structure
 - Reasons you agree, reasons you disagree, overall conclusion on your outcome

Evaluate the effectiveness of.

- Consider what is effective about the question topic
- Consider what is ineffective about the question topic
- Now write the answer using the following structure
 - Reasons you think it is effective, reasons you think it is not effective, overall conclusion on the effectiveness

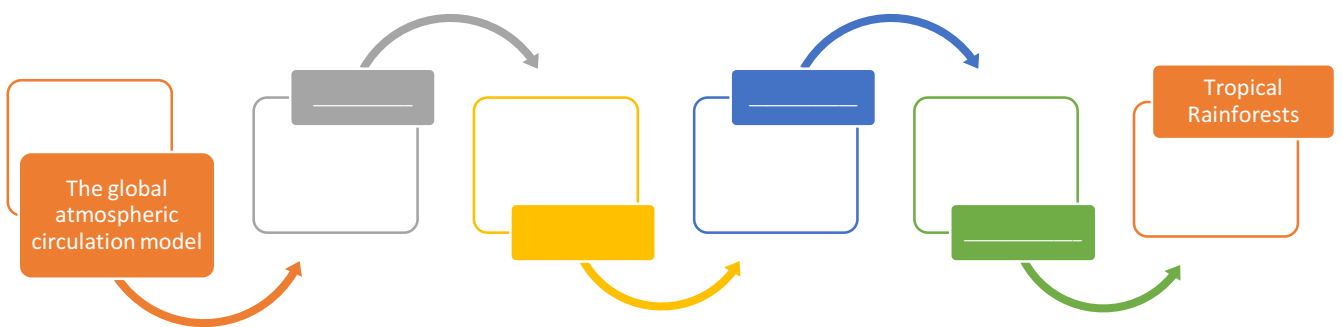
Explain

- Consider the in-depth reasons for the question topic (the how and why)
 - Make sure you have at least 4 reasons (points) you could discuss
 - Structure your answer explaining and expanding your points, one point per paragraph
1. “Ecosystems are more useful for humans when left intact.” Do you agree with this statement? Justify your reasons.
 2. Compare the characteristics of a Hot Desert and Tropical Rainforest Ecosystem.
 3. Assess the extent to which humans can be to blame for changes within ecosystems.
 4. Explain the way in which nutrients are recycled within a Tropical Rainforest Ecosystem and why this cycle can sometimes be broken.
 5. “Desertification is solely caused by humans.” Do you agree with this statement? Justify your reasons.
 6. To what extent are there more challenges than opportunities in Hot Desert Ecosystems?
 7. Evaluate the effectiveness of strategies used to conserve Tropical Rainforests.
 8. Using an example, explain the effects of humans and physical changes on a small-scale ecosystem.
 9. “Decomposers are essential to an ecosystem” Do you agree with this statement? Justify your reasons.
 10. “Deforestation brings both positive and negative impacts” Do you agree with this statement? Justify your reasons.

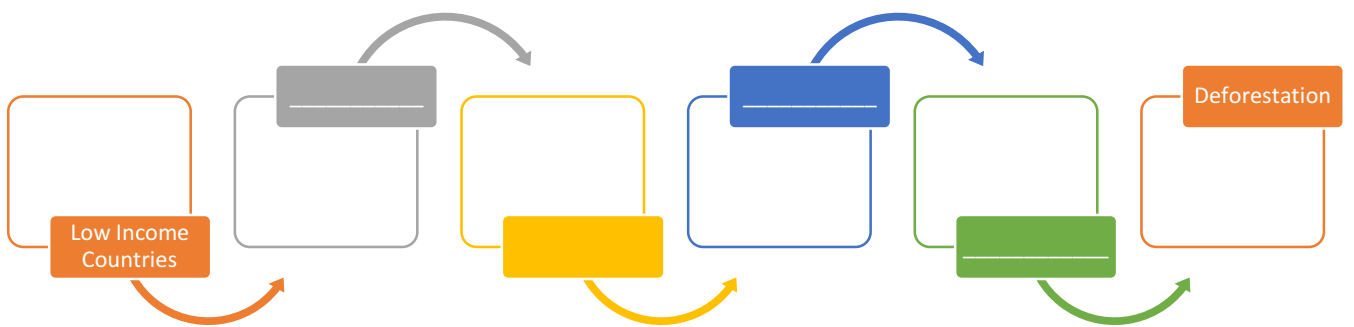
VI. Synoptic Thinking

Can you find the processes, interactions, links that connect the top and the bottom of the chain?

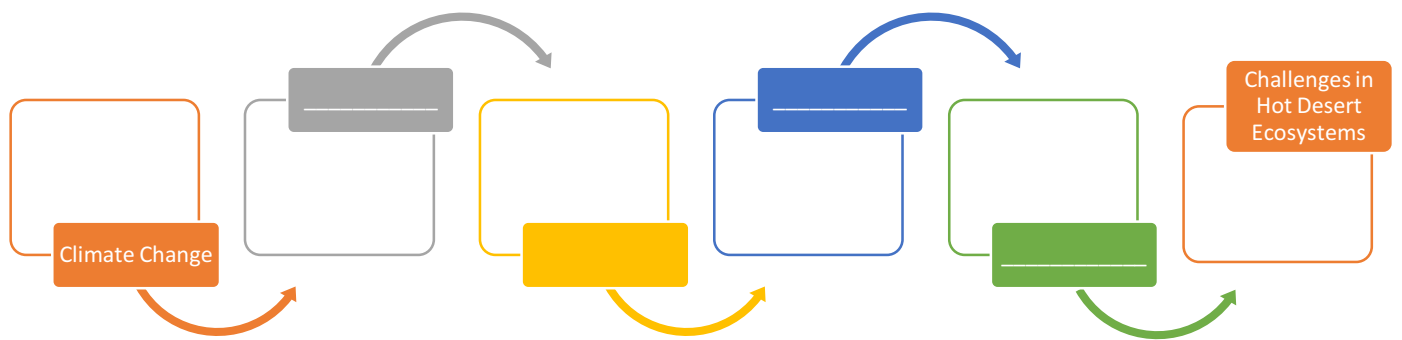
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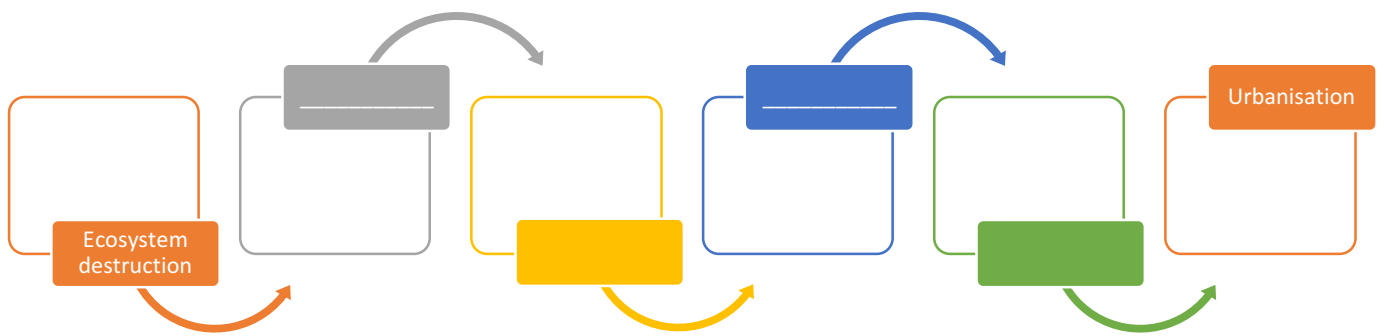
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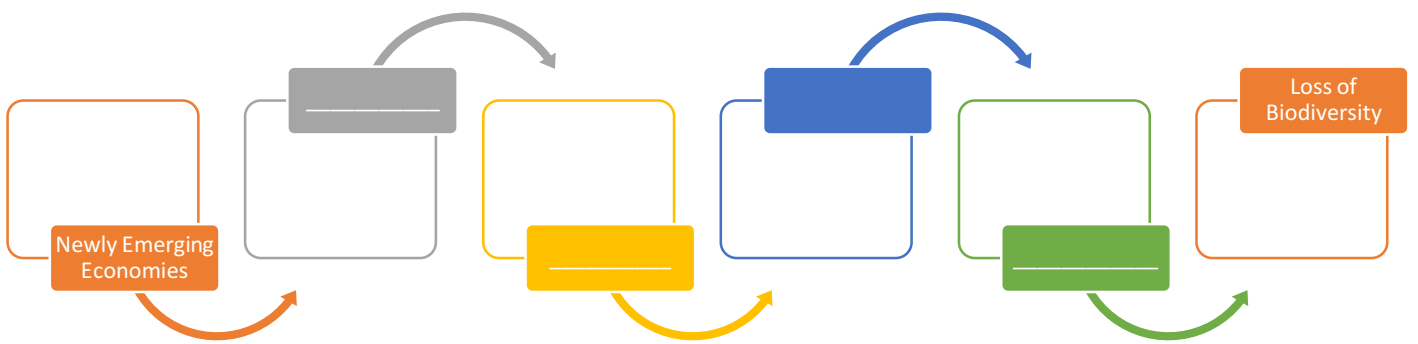
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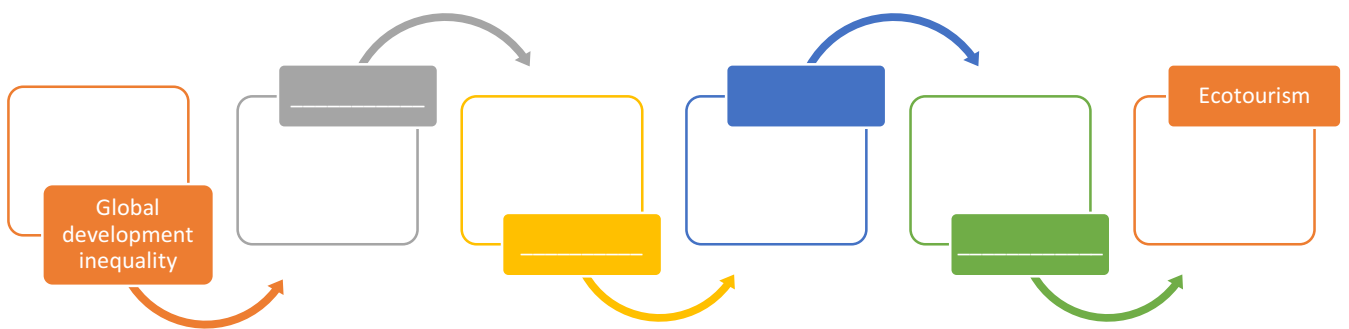
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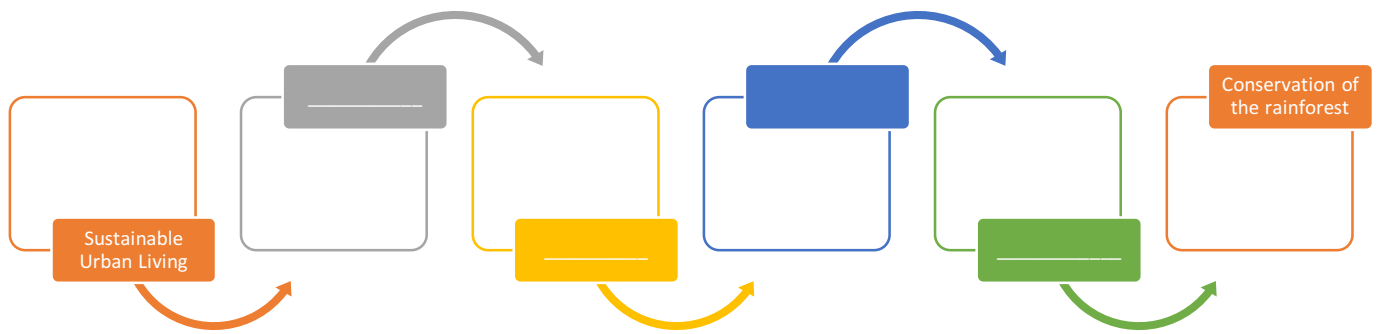
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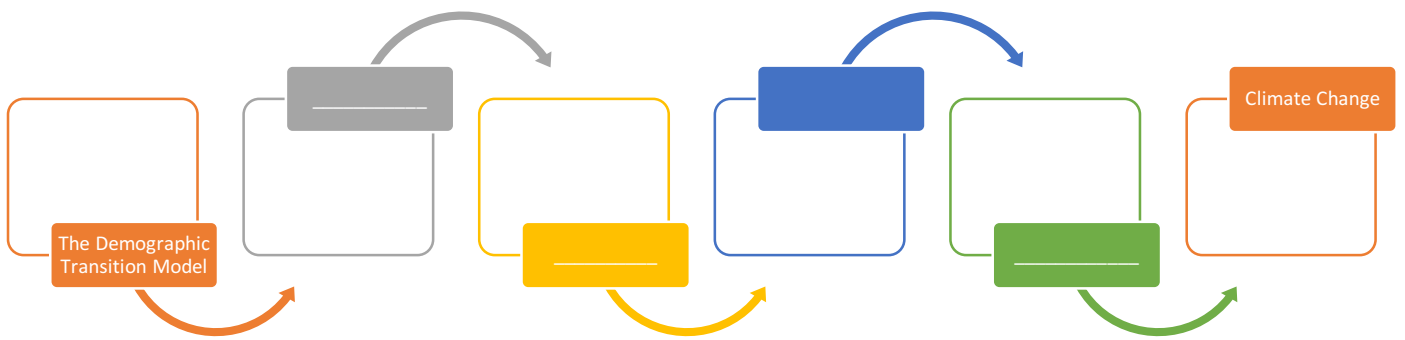
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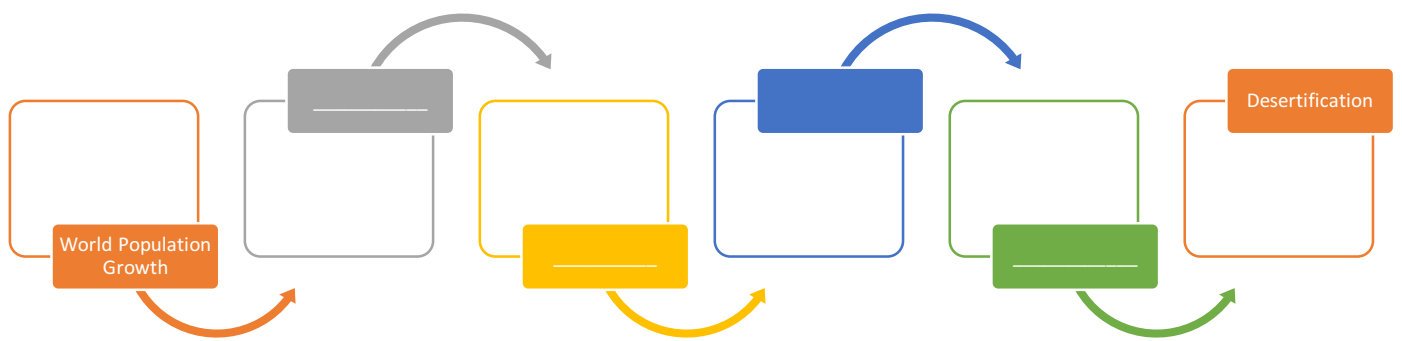
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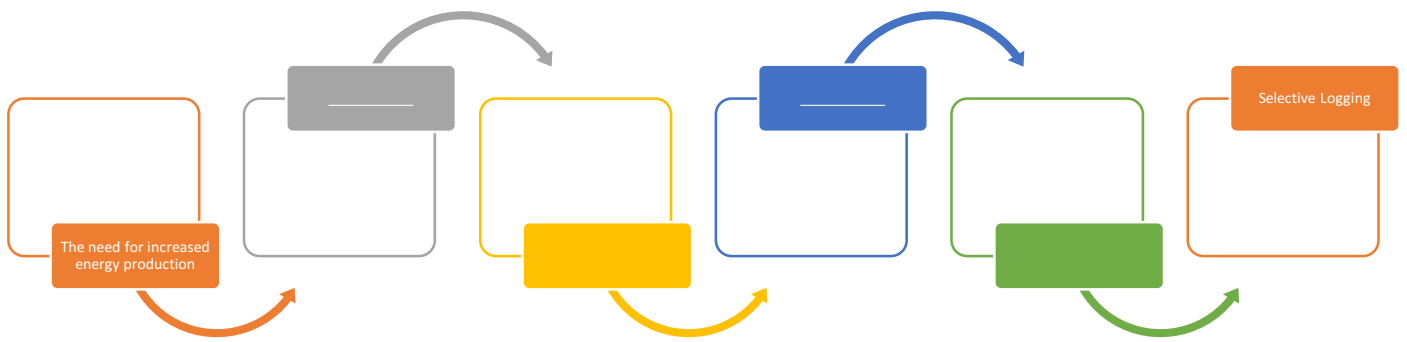
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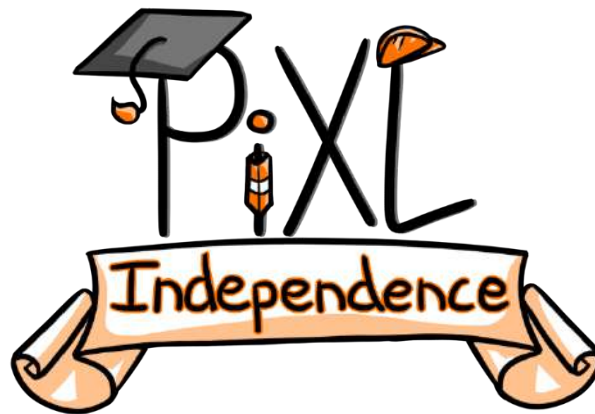


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