



Climate Change in Southeast Asia Lesson Plan

Grade Level: 9-12

Created By TAGE Teacher Consultant: Michelle Crane

Time Frame: One 55 minute class period (can complete at home, if necessary)

Curriculum Connection: This lesson is intended to be part of a 9th grade World Regional Geography course in a unit on Southeast Asia. It is assumed that students have already had prior instruction in the physical geography of the region and some introduction to natural disasters such as flooding and tsunamis. Some understanding of the processes responsible for climate change would also be desirable before students complete this lesson.

Learning Outcomes:

Upon completing this lesson, students should be able to:

1. Describe how people in Southeast Asia are or will be affected by rising sea levels caused by climate change,
2. Understand how the impacts of climate change will vary among countries at different levels of development.

TEKS Strand(s) Objective(s):

(8) **Geography.** The student understands how people, places, and environments are connected and interdependent. The student is expected to:

(B) describe the interaction between humans and the physical environment and analyze the consequences of extreme weather and other natural disasters such as El Niño, floods, tsunamis, and volcanoes;

(20) **Science, technology, and society.** The student understands how current technology affects human interaction. The student is expected to:

(B) examine the economic, environmental, and social effects of technology such as medical advancements or changing trade patterns on societies at different levels of development.

Materials :

For Student Use:	
Computer lab with internet connection	Optional – if computer lab is not available, see notes below
“Climate Change Conjures Up 'Alarming' Scenarios in Southeast Asia” Article from	One per student - Students may access this using the information provided under References. However, if computer lab is not available, the teacher can access the article and print it as a student handout.

Radio Free Asia	
Blank map of Southeast Asia	One per student, If a suitable blank map is not available, see References for an online source.
Colored pencils	
For Teacher Use:	
2012 East Asia Summit – ASEAN Economies Graphic	Included in the Climate Change and Impacts Module
Computer with projection device and internet connection	

References:

Climate Change Data. (2013). Retrieved September 12, 2013, from The World Bank:

<http://data.worldbank.org/topic/climate-change>

Landsberger, J. (n.d.). *The SQ3R Reading Method*. Retrieved September 12, 2013, from Study Guides and Strategies: <http://www.studygs.net/texred2.htm>

Maps of Continents and Large Regions. (n.d.). Retrieved September 12, 2013, from Arizona Geographic Alliance: http://geoalliance.asu.edu/azga_site/maps/regions

Ponnudurai, P. (2013, July 02). *Climate Change Conjures Up "Alarming" Scenarios in Southeast Asia*.

Retrieved September 12, 2013, from Radio Free Asia:

<http://www.rfa.org/english/commentaries/east-asia-beat/climate-change-07022013165938.html>

Strategies: Students will utilize the reading strategy SQ3R while reading the article. (If a thorough explanation of this method is needed, refer to the Reference section for an online source.) After they have completed reading, they will create a map based upon their reading.

Procedures to conduct the lesson:

Starting the Lesson: 5 minutes

Display the 2012 East Asia Summit – ASEAN Economies Graphic for the students to see. Have them complete the following questions:

1. According to the graphic, which 3 countries have the highest GDP?
2. According to the graphic, which 3 countries have the highest GDP per capita?
3. Explain why the answers to the questions above are different.
4. Using your knowledge of geography and the graphic, list the countries in Southeast Asia which would be most prone to flooding – either from the monsoons, rising sea levels, or tsunamis.
5. Which information, GDP or GDP per capita, gives the most accurate sense of which countries in Southeast Asia would be most able to recover from such a natural disaster? Explain why this would be so.

Asking Geographic Questions: 5 minutes

Introduce students to the Guiding Question:

How will Southeast Asia be impacted by climate change?

The Lesson:

Acquiring Geographic Information: 15 minutes

Hand out copies of the article to each student or direct them to the link online. If necessary, review the SQ3R method with students. Tell them that they are to take notes following SQ3R while they read.

Organizing Geographic Information: 15 minutes

Once the students have completed their reading, hand out the blank outline maps. They should create an annotated map illustrating the issues Southeast Asia will face as the climate changes. They will need to create symbols for each issue and include a key.

Analyzing Geographic Information: 10 minutes

Have students review their notes from the reading and their map. They will use the information to answer the guiding question. Make sure they know to include as many details as possible.

End the Lesson:

Closing product: 5 minutes

Answering Geographic Questions:

Write a short essay or paragraph answering the Guiding Question. Be sure to explain in detail how Southeast Asia will be affected by climate change. Use examples from the reading and your map. Think back to the warm-up activity. Explain which countries in Southeast Asia will be most able to mitigate the effects of climate change and which will have the most

Questions:

Explain how Southeast Asia will be affected by climate change.

- Rising sea levels will threaten settlement, industry, agriculture, and aquaculture through saltwater intrusion. Tropical areas will experience extreme temperatures; cool months will be warmer than the warmest months previously experienced. Increasing temperatures will increase heat-related deaths, forest fires and loss of crops. Ocean acidification will lead to extinction of coral reefs. Monsoon regions may be wetter and rivers may swell affecting water quality which will then lead to the spread of disease. Food production will be impacted by both saltwater intrusion and increasing temperatures leading to famine.

Explain why GDP per capita would be a more accurate prediction of a country's ability to recover from a natural disaster.

- Countries with higher GDP's tend to have more resources which can help them prepare for and deal with a natural disaster. For example, countries with higher GDP's tend to have access to more advanced technology which can alert people to an impending disaster. Also, building codes and other safety measures are more likely to be present and enforceable due to more stable and better funded government agencies which oversee such things. In addition, homes and buildings are typically built of more advanced materials, which can also better withstand some disasters. During and after the disaster, better equipped emergency management agencies such as fire, EMS, and police can better help rescue and aid victims. Access to better medical facilities can reduce deaths. More advanced infrastructure can make it easier for relief to reach victims. And more stable governments with access to more resources will be better prepared to rebuild. Most importantly, before and after, countries with higher GDP's tend to have more advanced communications systems which are crucial for alerting people to dangers and assisting with recovery. While higher GDP does not guarantee that a government is stable or prepared enough to deal with disasters in all of the ways listed, they are more likely to be able to than countries with lower GDP's.

Explain which countries will be most able to mitigate the effects of climate change.

- Based upon the per capita GDP, Brunei and Singapore would be most likely to mitigate the effects of climate change. The higher per capita GDP, the more resources each would have as listed above.

Evaluation/Assessment :

Use the following rubric to grade the map and the short answer question.

	Not There Yet	Satisfactory	Clearly Outstanding
Content	<p style="text-align: center;">1 Point</p> <ul style="list-style-type: none"> ▪ Answer merely lists disasters. ▪ Answer makes little to no attempt to analyze the impact of climate change. ▪ Answer and annotations do not utilize appropriate vocabulary. ▪ Answer and annotations are difficult to read due to spelling and/or grammar errors. ▪ Map features are missing or incorrectly labeled. 	<p style="text-align: center;">2 Points</p> <ul style="list-style-type: none"> ▪ Answer correctly describes most issues faced by climate change. ▪ Answer adequately analyzes the impact of climate change. ▪ Answer and annotations correctly utilize appropriate vocabulary. ▪ Answer and annotations are generally free from spelling or grammar errors. ▪ Most map features are correctly labeled. 	<p style="text-align: center;">3 Points</p> <ul style="list-style-type: none"> ▪ Answer completely and correctly describes each issue. ▪ Answer completely analyzes the impact of climate change. ▪ Answer and annotations demonstrate mastery of appropriate vocabulary. ▪ Answer and annotations are largely free from spelling or grammar errors. ▪ All map features are correctly labeled.
Appearance	<p style="text-align: center;">0.75 Points</p> <ul style="list-style-type: none"> ▪ Map features are not clear and are difficult to read. ▪ Annotations obscure map features. ▪ Map shows minimal effort. 	<p style="text-align: center;">1.25 Points</p> <ul style="list-style-type: none"> ▪ Map features are clear and legible. ▪ Annotations are neat and do not obscure map features. ▪ Map shows effort and attention to detail. 	<p style="text-align: center;">2 Points</p> <ul style="list-style-type: none"> ▪ Map features are clear, legible and attractively drawn. ▪ Annotations are neat and enhance the map presentation. ▪ Map shows great effort and attention to detail.