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LESSON NOTES

WORKSHEET 18

YEAR 12: GEOGRAPHY

NAME: _____

Strand	2.1 Natural Hazards
Sub Strand	12.1.1.2
Content Learning Outcome	The types of Hazards

What Drought means?

A drought is “a deficiency of precipitation over an extended period of time (usually a season or more), resulting in a water shortage.” Indicators of drought include precipitation, temperature, streamflow, ground and reservoir water levels, soil moisture, and snowpack.

How climate change contributes to drought:

- Warmer temperatures enhance evaporation, which reduces surface water and dries out soils and vegetation. This makes periods with low precipitation drier than they would be in cooler conditions.
- Climate change is also altering the timing of water availability.
 - Warmer winter temperatures are causing less precipitation to fall as snow in the Northern Hemisphere, including in key regions like the Sierra Nevada of California.
 - Decreased snowpack can be a problem, even if the total annual precipitation remains the same. This is because many water management systems rely on spring snowpack melt . Likewise, certain ecosystems also depend on snowmelt, which supplies cold water for species like salmon. Because snow acts as a reflective surface, decreasing snow area also increases surface temperatures, further exacerbating drought.
 - Some climate models find that warming increases precipitation variability, meaning there will be more periods of both extreme precipitation and drought. This creates the need for expanded water storage during drought years and increased risk of flooding and dam failure during periods of extreme precipitation.
- Climate change is making certain regions drier
 - Scientists For example, the Southwestern United States has already seen a decrease in annual precipitation since the beginning of the 20th century, and that trend is expected to continue.
 - Estimates of future changes in seasonal or annual precipitation in a particular location are less certain than estimates of future warming, and are active areas of research. However, at the global scale, scientists are confident that relatively wet places, such as the tropics and higher latitudes, will get wetter, while relatively dry places in the subtropics (where most of the world’s deserts are located) will become drier.

- In some areas, droughts can persist through a vicious cycle, in which very dry soils and diminished plant cover absorb more solar radiation and heat up, encouraging the formation of high pressure systems that further suppress rainfall, leading an already dry area to become even drier.

Severe drought can affect:

- **Water supply:** Droughts are defined by their lack of available water. During droughts, communities may have limited access to water for household use, including drinking, cooking, cleaning, and watering plants, as well as for agriculture, transportation, and power generation. Droughts may lead to higher water costs, rationing, or even the decimation of important water sources like wells,
- **Agriculture:** Droughts affect livestock and crops, including corn, soybeans, and wheat. Globally, drought struck several major breadbasket regions simultaneously in 2012, adding to food price instability. In countries already facing food insecurity, cost spikes can lead to social unrest, migration, and famine.
- **Transportation:** Droughts can lower river water levels, threatening commerce on rivers like the Mississippi. Transport barges need at least nine feet of water to operate, and to maintain this level, the U.S. Army Corps of Engineers had to blast, dredge, and clear obstructions on a key stretch of the Mississippi in 2013. Drought is also often accompanied by extreme heat, which can buckle roadways, ground planes, and warp public transit cables. Drought-fueled wildfires also have repercussions for travel by closing roadways and railroads and grounding planes when smoke is thick.
- **Energy:** Droughts can raise concerns about the reliability of electricity production from plants that require cooling water to maintain safe operations. Hydroelectric power may also become unavailable during droughts. When heat waves coincide with droughts, electricity demands can grow, compounding stress on the grid.
- **Public Health:** Reduced flows in rivers and streams can concentrate pollutants, threatening the quality of water used for drinking and recreation. Also, drought-fueled wildfires can expose nearby communities to smoke and pollutants, which can exacerbate chronic respiratory illnesses.

All of these drought impacts can inflict extreme costs on people, businesses, and governments.

Droughts also increase the amount of carbon dioxide in the atmosphere, including by decreasing

Activity

With reference to Monsoon Asia or Fiji, Discuss the effects of droughts and ways to minimize the effects.