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Chapter 1 : Causes and Effects of Drought | Earth Eclipse

What causes droughts? A drought is a period of drier-than-normal conditions that results in water-related problems. Precipitation (rain or snow) falls in uneven patterns across the country.

Check new design of our homepage! Droughts are not at all uncommon - with at least one occurring in some part of the world at any given point of time. Are they natural disasters or is their occurrence a perfectly normal phenomenon? These are the questions that we intend to answer through this write-up. ScienceStruck Staff Last Updated: Mar 6, In geographical studies, a drought is defined as an extended period of deficiency of water supply that the region is subjected to. While the same is generally attributed to low precipitation - i. It is important to take the causes and effects of drought into consideration to understand the severity of this issue, as understanding one makes it easier for you to understand the other. That being said, one has to get well-versed with the effects of drought on the planet before getting into the details on what causes it. Overview of Droughts Drought can be assessed on the basis of amount of precipitation from the meteorologists point of view , on the basis of assessment of water sources in the said region from the hydrologists point of view and on the basis of difficulty faced by agricultural crops in growing owing to lack of water from the farmers point of view. Similarly, the intensity of a drought differs from one geographical location to another - on the basis of what has triggered the same. While lack of precipitation can trigger a drought anywhere, the interior regions are most vulnerable to such harsh conditions as rain bearing clouds fail to make it to these regions. Even though droughts are not considered natural disasters as such, extended period without precipitation can cause havoc on the planet as water is very important for all living things on the planet. If droughts continue for extended period, it will result in severe effects on all the living things which inhabit the planet. The myth that drought only affects regions which are dependent on agriculture has become quite popular with time. However, the fact is that it can have a serious impact on economically well-to-do nation like the United States and Europe as well. While the developed nations might not face food shortage or other such direct problems, a drought can have its implications on the economy of the nation - which will reflect in the form of price rise and related economic issues. This makes it all the more important for a person to understand what causes drought, and how it affects the country as a whole, instead of just the region which is affected. Causes of Drought There is no questioning the fact that a drought is triggered by lack of precipitation over a course of time, but there has to be some underlying cause for this alteration in precipitation pattern, and this underlying cause has to be taken into consideration when discussing drought causes. Precipitation is one of the three attributes of the water cycle, while the other two are evaporation and condensation. If either of these steps of water cycle get disturbed, it results in severe alterations in other steps involved and eventually triggers a drought. In most of the drought prone regions, the process of condensation is severely hampered as a result of the prevailing high pressure conditions which are not conducive for cloud formation. While low pressure system generally replaces high pressure system as the latter moves on, some conditions - such as presence of jet streams or cold and hot water currents in the ocean, etc. Water vapor is a basic necessity when it comes to formation of clouds , and if the wind fails to carry required amount of moisture, it can hamper the cloud formation process. In south east Asia, water vapor that is formed over the Indian Ocean is brought on to the land by the winds blowing from the southwest direction. The winds in question here need to be strong enough to take the moisture from Indian Ocean across the Indian subcontinent. If they are not strong enough, they fail to carry the required amount of moisture, which - in turn, stalls condensation and eventually hampers the process of precipitation. Many a time we get to see that the windward side of the mountain receives abundant rain, while the leeward side of the same mountain experiences severe drought. This generally happens when these mountains block the moisture-laden winds from going to the other side. As they precipitate on the windward side, they become light as a result of which they rise and cross over. However, by the time this happens most of the moisture content in them is lost. That explains why windward side of the mountain is lush green, while the leeward side is a barren desert. The ability of soil to capture and hold water is hampered as a result of foul agricultural practices, deforestation,

erosion of top layer of soil, etc. Recent reports also associate droughts with climate change and global warming, whilst citing that their occurrences have been increasing with rising global near-surface temperature. While droughts are natural occurrences which are attributed to certain environmental factors, the fact that they worsen over the course of time makes it difficult for us to assess the damage they do. Droughts are considered to be one of the three most severe threats to humans on the planet - alongside famine and floods. A look in the history, and we find quite a few examples of the havoc wreaked by them on the planet, and the Dust Bowl i.

Chapter 2 : What Causes Drought? | LoveToKnow

The "new normal" of water management across the United States suggests we need to consider the regions we live in are either heading into a drought or coming out of a drought. California is in a mega drought and most data indicates water is becoming more available. Georgia is heading into a.

In , California had the driest year on record. There are different types of drought Drought can call to mind images of dry, cracked earth; low reservoir levels; and barren fields, yet these are actually examples of different types of drought, each of which is measured differently. We most often think about drought in relation to precipitation, assessing the degree of dryness in comparison to a local or regional average and the duration of the dry period. This is known as a meteorological drought, which is highly specific to a region as average precipitation may vary considerably spatially. Farmers are most concerned with agricultural drought when available water supplies are not able to meet crop water demands. Agricultural droughts can occur for a variety of reasons, including low precipitation, the timing of water availability, or decreased access to water supplies. For instance, earlier snowmelt may not change the total quantity of water available but can lead to earlier runoff that is out of phase with peak water demand in the summer. Thus, it is possible to suffer an agricultural drought in the absence of a meteorological drought. The United States Drought Monitor has been producing weekly maps of drought conditions throughout the country since Climate change affects a variety of factors associated with drought When considering the relationship of drought to climate change, it is important to make the distinction between weather and climate. Weather is a description of atmospheric conditions over a short period of time, while climate is how the atmosphere behaves over relatively long periods of time. Individual drought periods can be understood as discrete weather events. Climate changes occur over longer periods and can be observed as changes in the patterns of weather events. For instance, as temperatures have warmed over the past century, the prevalence and duration of drought has increased in the American West [2]. Global climate change affects a variety of factors associated with drought. There is high confidence that increased temperatures will lead to more precipitation falling as rain rather than snow, earlier snow melt, and increased evaporation and transpiration. Thus the risk of hydrological and agricultural drought increases as temperatures rise. Much of the Mountain West has experienced declines in spring snowpack, especially since mid-century [3]. These declines are related to a reduction in precipitation falling as snow with more falling as rain , and a shift in timing of snowmelt. Earlier snowmelt, associated with warmer temperatures, can lead to water supply being increasingly out of phase with water demands. While there is some variability in the models for western North America as a whole, climate models unanimously project increased drought in the American Southwest. The Southwest is considered one of the more sensitive regions in the world for increased risk of drought caused by climate change [4]. We must prepare for an increased risk of more frequent and severe drought conditions Current responses to drought tend to focus on short-term measures, such as temporary water conservation and efficiency improvements, water transfers, and increased use of groundwater. However, with increased drought risk, we must incorporate longer-term efforts that increase resilience to more frequent or severe drought conditions. Better monitor and measure water supply and uses nationwide Reduce indoor water use through more efficient appliances, technologies, and behaviors Reduce outdoor water efficiency through drought-tolerant landscape design and improved irrigation technologies Increase recycling and reuse of water, including capturing and reusing stormwater, greywater, and wastewater Make more strategic use of groundwater References [1] http: Global Change Research Program. Melillo, and Thomas C. Cambridge University Press We Need Your Support to Make Change Happen We can reduce global warming emissions and ensure communities have the resources they need to withstand the effects of climate changeâ€”but not without you. Your generous support helps develop science-based solutions for a healthy, safe, and sustainable future.

Chapter 3 : Drought - Wikipedia

Droughts are caused by changes in land and sea surface temperatures, atmospheric circulation patterns and soil moisture content. A change in any one of these factors sets up a cyclical chain of events that can result in extreme climate conditions such as drought. Unusual warming or cooling of sea.

Documentation Key Points Average drought conditions across the nation have varied since records began in The s and s saw the most widespread droughts, while the last 50 years have generally been wetter than average see Figure 1. Over the period from through , roughly 20 to 70 percent of the U. The years â€" and â€" had a relatively large area with at least abnormally dry conditions, while , , and â€" had substantially less area experiencing drought. During the latter half of , more than half of the U. In several states, was among the driest years on record. Background There are many definitions and types of drought. Meteorologists generally define drought as a prolonged period of dry weather caused by a lack of precipitation that results in a serious water shortage for some activity, population, or ecological system. Drought can also be thought of as an extended imbalance between precipitation and evaporation. An increase in evaporation makes more water available in the air for precipitation, but contributes to drying over some land areas, leaving less moisture in the soil. Thus, as the climate continues to change, many areas are likely to experience increased precipitation see the U. As a result, since the s, some regions of the world have experienced longer and more intense droughts, particularly in southern Europe and West Africa, while other regions have seen droughts become less frequent, less intense, or shorter for example, in central North America. The impacts vary depending on the type, location, intensity, and duration of the drought. For example, effects on agriculture can range from slowed plant growth to severe crop losses, while water supply impacts can range from lowered reservoir levels and dried-up streams to major water shortages. Prolonged droughts pose a particular threat to indigenous populations because of their economic and cultural dependence on land and water supplies. Warming and drought can threaten medicinal and culturally important plants and animals and can reduce water quality and availability, making tribal populations particularly vulnerable to waterborne illnesses. About the Indicator During the 20th century, many indices were created to measure drought severity by looking at precipitation, soil moisture, stream flow, vegetation health, and other variables. An index value of zero represents the average moisture conditions observed between and at a given location. A positive value means conditions are wetter than average, while a negative value is drier than average. Index values from locations across the contiguous 48 states have been averaged together to produce the national values shown in Figure 1. This part of the indicator covers all 50 states and Puerto Rico. Indicator Notes Because this indicator focuses on national trends, it does not show how drought conditions vary by region. For example, even if half of the country suffered from severe drought, Figure 1 could show an average index value close to zero if the rest of the country was wetter than average. Thus, Figure 1 might understate the degree to which droughts are becoming more severe in some areas while other places receive more rain as a result of climate change. Drought Monitor Figure 2 offers a closer look at the percentage of the country that is affected by drought. This index is relatively new, however, and thus too short-lived to be used for assessing long-term climate trends or exploring how recent observations compare with historical patterns. With several decades of data collection, future versions of this indicator should be able to paint a more complete picture of trends over time. Overall, this indicator gives a broad overview of drought conditions in the United States. It is not intended to replace local or state information that might describe conditions more precisely for a particular region. Historical data in table form are available at: The physical science basis. The impacts of climate change on human health in the United States: Global Change Research Program. A review of twentieth-century drought indices used in the United States. State of the climate: National Centers for Environmental Information.

Chapter 4 : What Causes Droughts? | Wonderopolis

A common misconception of droughts is that they're brought on by periods of no rain or snow. While this certainly can initiate drought conditions, oftentimes the onset of a drought is less noticeable.

Temperature of Oceans and Land Precipitation is the result of the natural process in which: The moisture then condenses in the atmosphere. Finally, the moisture becomes concentrated and falls to the earth once more. The process is driven by the heat of the sun; the hotter it is, the greater the rate of evaporation. Thus, if the temperature of the ocean or the surface of the land is relatively cool in a certain area, drought may occur in regions that rely on those sources of moisture. For example, cold temperatures in the Pacific Ocean near the equator are usually correlated with low rainfall in the western and central US. Air Circulation Patterns in the Atmosphere Large-scale weather patterns, including the distribution of rainfall, are largely driven by the patterns of air circulation in the atmosphere. As hot air rises and expands, it creates a contrasting flow of air from cooler areas where air condenses and sinks. This gives rise to air currents that move moisture around the atmosphere and result in different patterns of rainfall in different regions. When there is an anomaly in surface temperatures, typical patterns of air circulation change, which means precipitation patterns also change. This leads to higher-than-average rainfall in some areas and drought in others. El Nino and La Nina are prime examples of a major fluctuation in air currents, which is often associated with drought in locations such as Africa, Australia, India, Brazil and Hawaii. Quantity of Moisture in the Soil Soil moisture influences cloud formation, or the lack of it, at a more local level. If the ground is dry, there is no local source for the moisture that causes clouds to form. This leads to hotter surface temperatures which make the soil even drier. The cycle builds on itself and results in long term droughts. The Human Connection Besides meteorological factors that cause drought, human activity can also be a cause. Human activity has reduced the amount of rainfall in many regions of the world. Sometimes how much water humans consume, and the timing of that consumption, factors into how much water is available at a later date for people, plants and animals. Thus, drought can also be viewed as an imbalance between supply and demand. Deforestation Widespread deforestation can contribute to drought especially in regions where rainfall is formed by local water cycles. In conventional rainfall, water evaporates from local land and water sources during high temperature. The water-laden air rises up in the atmosphere, where it is cooled and comes down as rain. This is common in the tropics. Forests lose water through evapo-transpiration which feeds the local water cycle. When forests are cut, there is less water evaporating which in turn reduces the amounts of clouds that are formed. The Amazons are already experiencing this kind of "self-amplified drought" according to a scientific study. Soil Degradation Soil degradation occurs when protective plant cover especially forests are lost exposing the soil. Intensive farming, which involves deep plowing and use of chemicals that destroy soil structure, is another widespread cause. Loss of cover or structure reduces capacity of the soil to absorb and hold water, and results in runoff and decreases the time available for water to seep into deeper layers of the soil. So soils dry up quickly and cannot support growth of plants and crops and in the short term lead to agricultural droughts. When there is more runoff, and less infiltration and percolation of rain water into the soils, there is less groundwater that is added, that leads to longer term hydrological drought. Increased Demand For Water As opposed to meteorological drought, which is a result of only weather and climatic conditions, hydrological drought is caused by lack of precipitation rain and snow over longer periods, and a greater demand for water in a given region than is available. Sources for water may include natural lakes and rivers, manmade reservoirs and groundwater. Building of dams upstream for hydroelectricity can cause water scarcity downstream. Wildlife and aquatic organisms also depend on certain water levels in lakes and rivers to survive, and vegetation depends on certain levels in the water table. Hydrological drought requires a long term to be mitigated as recharging of natural water sources happens slowly. When the demand for water is high during a period of low rainfall, when the rivers and groundwater are not re-charged as usual, the impacts can be worse. Timing The timing of precipitation and water demand has a lot to do with when a drought occurs. Even if the overall water supply is low, drought is usually less of a concern in the winter months because demand is far less than in the summer.

When the distribution of precipitation occurs more in the summer than in the winter, a lot of the water is quickly lost to evaporation and runoff, rather than being stored as snowpack. This causes drought conditions later on when people or natural systems are accustomed to having water available from snowmelt. Climate Change and Drought As human-caused climate change is increasingly accepted as a scientific fact, its effects on drought are being studied in detail. As the meteorological mechanisms that cause drought make clear: Abnormal fluctuations in temperature correspond to abnormal variations in precipitation. Increases in temperature have the potential to cause more frequent and severe droughts , which puts climate change in the crosshairs as a major cause of drought in the present day. Between , the U. NASA points out there is conclusive scientific evidence that global warming makes the planet hotter on average, which makes heat waves more intense and droughts more severe. In continental United States the frequency and severity of droughts is expected to increase across the country during the next few decades. Guarding Against Dry Times The causes of drought are complex, interrelated and, increasingly, manmade. However, there are many ways to conserve water , which is becoming more and more of a priority in regions that are afflicted by drought. In fact, people everywhere should consider practicing water conservation as a preventative measure against future droughts. Was this page useful?

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Chapter 5 : Droughts and Floods - Climate, Energy, and Society - College of Liberal Arts - Auburn Universi

A drought is a period of below-average precipitation in a given region, resulting in prolonged shortages in the water supply, whether atmospheric, surface water or ground water.

Droughts can be triggered by natural or human induced factors. Dry land affected by drought. Droughts are a type of natural disaster that involves below-average precipitation or a severe water supply shortage over a sustained period of time. Droughts often give rise to famines that can lead to the loss of millions of lives. Here is a list of the factors that trigger a drought: Low Levels of Precipitation Little or no precipitation is one of the major causes of a drought. Lower than average levels of rainfall over a sustained period of time can dry the soil and and lead to crop failures. Meteorological disturbances like extremely high temperatures and changes in wind patterns can lead to lower than normal rainfall in an area. Droughts are usually common in places where normal levels of rainfall are generally low, making them more susceptible to changes in precipitation patterns. These events are thus linked to droughts in different parts of the world at different times depending on the strength of the events. Dry Season Droughts are common in areas experiencing long, dry seasons. Since humidity levels are low during these seasons, water evaporation rates are high. As a result, water bodies like lakes and rivers dry up nearly completely. Vegetation cover and agricultural crops dependent on these water bodies also die due to the absence of water. Higher temperatures during the dry season further promote the evaporation of water and thus worsen the drought. Climate Change Global warming induced climate change is believed to be one of the more recent causes of drought. While climate change can bring more precipitation to some areas due to the melting of glaciers and higher rates of evaporation from water bodies, it will lead to droughts in other areas where higher temperatures will dry up the remaining water bodies. Human Activities Irresponsible agricultural practices like the over-irrigation depleting water resources and over-farming adversely impacting the soil quality of land can often lead to droughts. Deforestation can also cause a drought since the absence of tree cover makes soil more susceptible to the erosional forces of wind and water. Thus, human activities can also trigger drought or worsen the impact of a drought caused by meteorological alterations. This page was last updated on September 14, By Oishimaya Sen Nag.

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Chapter 6 : What causes drought?

Causes of Drought Rainfall or Precipitation Deficiency Droughts take place whenever there is prolonged periods of rainfall deficiency for a season or more and usually when there is a lack of anticipated rainfall or precipitation.

Effects of droughts Water is involved in every part of human life and also for plants and animals. There are so many ways that water affects us both directly and indirectly. Let us consider this scenario: Assuming that the rains do not come in a particular year. Crops yield will be very low and farms will have to close production. Local farm produce sellers will have nothing to sell. But that is not all. Because farmers closed production, they will not buy farming materials such as seeds, fertilizers, tractors, and so on. That means many more businesses that produce these materials and equipment will also be affected. They will also lose sales and have to lay people off. When people are laid off, they cannot buy things and cannot take care of their families. That is an indirect effect, and it can be even more devastating, complex and long term. That is just one way of looking at it. Here are some more: Imagine that you turn the tap on and no water flows, and the water authority officials tell you that water will not flow for weeks or months because there is a drought. Imagine that the lights are off because the Hydro-electric dam that produces power is closed because of low water levels. Imagine that people cannot go to school and work because there is the outbreak of diseases as a result of lack of water for sanitation purposes. What if there are many wild fires because of extreme dryness caused by lack of rains and high temperatures. So you see, there is a myriad of problems that droughts can bring. All the problems can be grouped into three main impact areas. So, let us see the three major areas in which droughts impact us. Click on each impact to read more:

Chapter 7 : Climate Change Indicators: Drought | Climate Change Indicators in the United States | US EPA

Drought ranks second in terms of national weather-related economic impacts, with annual losses nearing $9 billion per year in the U.S. [1] Beyond direct economic impacts, drought can threaten drinking water supplies and ecosystems, and can even contribute to increased food prices. Within the last.

During dry and hot weather periods, it is common to find dry and cracked earth without even a single shed of water or wet areas. Lakes, rivers, and streams may as well run dry. Well, these are the typical earth conditions that define drought in layman terms. Drought can simply be defined as extended periods of precipitation shortage, normally for a season or more resulting in water deficiency for some human activities or environmental sustainability. Human activities such as farming, irrigation, or domestic uses of water are normally highly impacted during droughts. Plant and animal life are similarly affected. Accordingly, drought is a natural event arising due to less precipitation than expected thus defining the intricacies witnessed when the demands for water supply are higher than the available water for some activity, humans, or the environment. Causes of Drought Rainfall or Precipitation Deficiency Droughts take place whenever there is prolonged periods of rainfall deficiency for a season or more and usually when there is a lack of anticipated rainfall or precipitation. When a region goes for long periods without any rain, especially for more than a season, then the situation leads to dry conditions and water deficiency which qualify as drought. In such cases, it is frequently termed as agricultural drought. Human Causes Human activities play a relatively significant role in the management of the water cycle. Human acts such as deforestation, construction, and agriculture negatively impact the water cycle. Trees and vegetation cover are essential for the water cycle as it helps to limit evaporation, stores water, and attracts rainfall. In this sense, deforestation â€" clearing vegetation cover and cutting down trees increases evaporation and lessens the ability of the soil to hold water leading to increased susceptibility of desertification. Construction and agricultural activities may as well reduce the overall supply quantity of water, resulting in dry spells. Drying out of Surface Water Flow Lakes, rivers, and streams are the primary suppliers of downstream surface waters in various geographical regions around the globe. In extremely hot seasons or because of certain human activities, these surface water flows may dry out downstream contributing to drought â€" meaning the demands for water supply become higher than the available water. Irrigation systems and hydro-electric dams are some of the human activities that can significantly diminish the amount of water flowing downstream to other areas. Consequently, evaporation and evapotranspiration levels have risen, and the higher temperatures have led to wildfires and extended dry spell periods. The global warming situation tends to exacerbate the drought conditions. Some of the worst droughts witnessed in sub-Saharan Africa have been associated with global warming and climate change. Effects of Drought The effects of drought are widespread and have devastating effects on the environment and the society as a whole. Water use is part and parcel of almost every human activity as well as the life of plants and animals. On this basis, extended deficiency of water can affect the society in various ways both directly and indirectly. The effects can therefore generally be categorized as environmental, economic, and social. Environmental Impacts of Droughts Animal and plants die off as a consequence of drought. Mainly, the damages arise out of extensive destruction of the wildlife habitats and reduction in water quality and quantity. Some plants and animals may completely fail to recover after the drought. The overall climate, the rocks, and soils are also affected, negatively impacting various living and non-living factors. Drying out of water bodies Surface waters such as lakes, rivers, ponds, creeks, streams and lagoons dry out during extended dry conditions which destroy natural habitats. Most especially, aquatic life and other wildlife dependent on these water bodies die or become endangered, destroying the entire food chain and alters the ecosystem. Reduction in soil quality Soil moisture, essential for soil microbial activities, is reduced in drought conditions. As a result, soil quality is lowered because of minimized organic activity and continued dry spell which kills soil organisms. The end result is dry and cracked soil and it even becomes easier for decertification to occur. Unsuitable conditions for plant and vegetation survival Drought conditions make it unsuitable for plants and vegetation cover to survive. Besides, fertile lands are lost as a result of drought, and in consequence,

desertification sets in. Desertification is whereby the lands become infertile and bare, frequently as a result of overgrazing and is exacerbated by drought which makes it difficult for such lands to recover. Migration and even death of Animals and Wildlife Animals and wildlife are forced to migrate in drought conditions since they have to move for long distances to get water and food. The prevailing circumstances during droughts also make it difficult for the survival of the animals. When the wildlife and animals migrate, they end up in new locations where they can be vulnerable, endangered because of new threats. This leads to loss of biodiversity and disruption of the natural ecosystems. Economic Impacts of Droughts The economic impacts of drought are realized from monetary and business losses incurred during droughts by governments, businesses, families, and at the individual level. These are some of the examples of economic effects of droughts Increased budgetary spending by farmers During droughts, farmers spend more money on crop irrigation so as maintain crop yields. Also, lots of water has to be availed for watering the farm animals to ensure the daily water consumption standards are met. Hence, farmers have to spend more money to buy water or drill wells to keep the crops and livestock nourished with enough water. Reduced crop yields Often, low crop yields are experienced during drought periods. Therefore, farmers usually undergo major economic losses because of low crop yields. They pay for lots of inputs and labor, but the outcomes are less. Industrial and governmental losses Industries and businesses in farm equipment manufacturing and merchandising respectively loss millions of dollars when farmers lack the money to buy their resources. Governments, on the other hand, have to allocate more money and spend even more for drought mitigation as they have to cushion the farmers and the entire society from the adverse impacts of the droughts. Such governmental monetary spending includes funds for emergency supplies, seed funds, and availing other relevant drought mitigation resources. Higher energy cost for economies dependent on hydro-power Extended dry spells can translate to lowered water levels in rivers and dams used to generate hydro-power. This means higher costs of energy for businesses because the hydro-energy companies are driven to operate below capacity. Businesses at times have to use fuel-powered generators which result in higher business operation costs. At the same time, increased energy demands lead to increased cost of grid energy, which leads to economic losses both for energy industries and businesses. Social Impacts of Droughts Social implications are possibly the most felt effects of drought. They are the direct effects to people and communities. They include Outbreak of waterborne diseases Since water scarcity is high during drought conditions, water quality significantly depreciates. This means the availability of clean water for drinking and water for sanitation and cleaning may not be sufficient. Droughts also increase the concentration levels nutrients, chemicals, and solid particles or impurities in surface waters. As a result, managing and preventing waterborne diseases such as typhoid and cholera becomes increasingly difficult, especially in poor regions. Hunger, anemia, malnutrition, and deaths Hunger, anemia, malnutrition and deaths of people are often witnessed in drought-stricken areas. Drought is a great causal factor for low food production, thus, when experienced in poorer regions the effects of malnutrition, hunger, anemia and mortalities are compounded since there is little food available for consumption. Often, it is as a result of lack of sufficient food nutrition that directly contributes to diseases and health vulnerability. Common cases of hunger, anemia, malnutrition, and mortalities are recorded in poorer nations. Migration of people and anxiety People are forced to shift to other places in search for better living conditions during droughts. This contributes to loss of livelihoods and disorients small-scale farmers who are dependent on their farm produce. People forced to migrate also undergo lots of stress, anxiety and are compelled to indulge in strenuous activities to provide for their families. Women, children, and the elderly are the most affected.

Chapter 8 : Effects of droughts

What causes drought? Lack of rainfall (or precipitation) Droughts can occur when there is the lack of 'expected' precipitation (rain and snow).

Drought Questions What is a drought? Its impacts result from the interplay between the natural event less precipitation than expected and the demand people place on water supply, and human activities can exacerbate the impacts of drought. What causes a drought? Drought has many causes. It can be caused by not receiving rain or snow over a period of time. If you live in a place where most of the water you use comes from a river, a drought in your area can be caused by places upstream from you not receiving enough moisture. There would be less water in the river for you and other people who live along the river to use. People can also play a big role in drought. If we use too much water during times of normal rainfall, we might not have enough water when a drought happens. Can scientists predict if a drought is going to happen? Studies conducted over the past century have shown that meteorological drought is never the result of a single cause. It is the result of many causes including, global weather patterns, high pressure, the tropical outlook and other global-scale variables. Are there places in the United States that experience drought? The Western United States is experiencing an exceptional and extreme drought at this time. What was the Dust Bowl? The s drought is often referred to as if it were one episode, but it was actually several distinct events occurring in such rapid succession that affected regions were not able to recover adequately before another drought began. The term Dust Bowl was coined in to describe the drought-affected south central United States in the aftermath of horrific dust storms. Although it technically refers to the western third of Kansas, southeastern Colorado, the Oklahoma Panhandle, the northern two-thirds of the Texas Panhandle, and northeastern New Mexico, the Dust Bowl has come to symbolize the hardships of the entire nation during the s. How bad was the drought in the Dust Bowl years? In the s, drought covered virtually the entire Plains for almost a decade. Many crops were damaged by deficient rainfall, high temperatures, and high winds, as well as insect infestations and dust storms that accompanied these conditions. Although records focus on other problems, the lack of precipitation would also have affected wildlife and plant life, and would have created water shortages for domestic needs. What was the Black Sunday Dust Storm? The s were times of tremendous hardship on the Great Plains. Settlers dealt not only with the Great Depression, but also with years of drought that plunged an already-suffering society into an onslaught of relentless dust storms for days and months on end. Drought affects our lives in many different ways because water is such an important part of so many of our activities. We need water to live, and animals and plants do too. We need water to grow the food we eat. We also use water for many different things in our lives, like washing dishes, cooking, bathing, and swimming or river rafting. Water is also used to help make the electricity we use to run the lights in our houses and the video games you may like to play. One of the easiest steps we can take to help mitigate the impacts of drought is conserving water. If we use water wisely at all times, more water will be available to us and to plants and wildlife when a drought happens. We can lose a lot of water doing simple everyday tasks. Did you know that turning off the water while you brush your teeth can save more than gallons of water a month? If you have a leaky faucet, the drips can add up to gallons of wasted water a month. Types of Drought What are the different types of drought? There are four basic approaches to measuring drought: The first three approaches deal with ways to measure drought as a physical phenomenon. The last deals with drought in terms of supply and demand, tracking the effects of water shortfall as it ripples through socioeconomic systems. Definitions of meteorological drought must be considered as region specific since the atmospheric conditions that result in deficiencies of precipitation are highly variable from region to region. For example, some definitions of meteorological drought identify periods of drought on the basis of the number of days with precipitation less than some specified threshold. This measure is only appropriate for regions characterized by a year-round precipitation regime such as a tropical rainforest, humid subtropical climate, or humid mid-latitude climate. Agricultural drought links various characteristics of meteorological or hydrological drought to agricultural impacts, focusing on precipitation shortages, differences between actual and potential evapotranspiration, soil

water deficits, reduced groundwater or reservoir levels, and so forth. Plant water demand depends on prevailing weather conditions, biological characteristics of the specific plant, its stage of growth, and the physical and biological properties of the soil. A good definition of agricultural drought should be able to account for the variable susceptibility of crops during different stages of crop development, from emergence to maturity. Hydrological drought is associated with the effects of periods of precipitation including snowfall shortfalls on surface or subsurface water supply i. The frequency and severity of hydrological drought is often defined on a watershed or river basin scale. Although all droughts originate with a deficiency of precipitation, hydrologists are more concerned with how this deficiency plays out through the hydrologic system. Hydrological droughts are usually out of phase with or lag the occurrence of meteorological and agricultural droughts. It takes longer for precipitation deficiencies to show up in components of the hydrological system such as soil moisture, streamflow, and groundwater and reservoir levels. As a result, these impacts are out of phase with impacts in other economic sectors. Socioeconomic definitions of drought associate the supply and demand of some economic good with elements of meteorological, hydrological, and agricultural drought. It differs from the aforementioned types of drought because its occurrence depends on the time and space processes of supply and demand to identify or classify droughts. The supply of many economic goods, such as water, forage, food grains, fish, and hydroelectric power, depends on weather. Because of the natural variability of climate, water supply is ample in some years but unable to meet human and environmental needs in other years. Socioeconomic drought occurs when the demand for an economic good exceeds supply as a result of a weather-related shortfall in water supply. Climatology is the study of climate. Or, more formally, it is a deficiency of rainfall over a period of time, resulting in a water shortage for some activity, group, or environmental sector. Drought Index â€" a numerical scale that scientists use to describe the severity of a drought. Drought indices are one type of drought indicator. It may be a record of a single measurement, such as rainfall at a particular rain gauge. It may also be a complex index. Drought indices indexes are a subset of drought indicators. The term was coined in the s, when dry weather and high winds caused many dust storms throughout the United States, but particularly in this area. The Intergovernmental Panel on Climate Change uses mitigation to mean reducing emissions of greenhouse gasses. Drought Severity Classification Click on the chart to make larger! Click Here to see the current U. Drought Activities Lesson Plan: Here is a lesson plan on water conservation. Here is a lesson plan on how drought affect agriculture. Science Fair Project Ideas: Here is a complete list of science fair project ideas. Discover the science behind the weather that impacts us every day.

Chapter 9 : BBC - GCSE Bitesize: Human activities causing drought

What is a drought? A drought is when there is a lack of precipitation over an extended period of time, usually a season or more, resulting in a water shortage for some activity, group, or environmental sector.

Share What are Droughts? The entire human, plant and animal life spins around water. Lack of water can bring a region to its knees. Some regions entirely depend on agriculture for survival and when lack of water persists; their futures are literally dried up. The main cause of water shortage is drought. Drought is a natural disaster that can have far reaching impacts. According to the National Climate data Centre, droughts comes in second to hurricanes in regards to causing severe economic impacts. Droughts are generally periods that rainfall is below normal, leading to extended periods of water shortage. Droughts can also be defined as temporary situations when water demands in a hydrological system surpass the income of water from other sources. In most ecosystems, precipitation is the major source of water supply, which is why many droughts occur due to precipitation failure. During the period of extended water shortage , atmospheric, surface and ground water can reduce substantially or dry up altogether. Droughts are able to cause destruction and losses because their end cannot be predicted. They can last for months or years. This is because their destructive impacts are not instant. However, droughts can be disastrous in the long run. Types of Drought Different sets of people have different definitions of drought. Meteorologists define drought as a prolonged duration without rain. Crop farmers describe drought as the absence of moisture, which inhibits crop growth. Hydrologists define drought as an extended period of less precipitation and stream flow. These definitions of drought bring us to the main types of droughts, which include: Meteorological drought This kind of drought takes places when dry weather patterns outweigh other climatic conditions. It is greatly determined by the overall absence of moisture in the atmosphere, for instance, lack of precipitation coupled with other weather conditions like high temperatures and dry winds. Metrological drought is a warning sign of potential water shortage if conditions remain constant for extended period. This kind of drought can also be short lived, which means it can start and end in a short period. Agricultural drought This kind of drought occurs when atmospheric moisture is minimized to the degree that soil moisture is impacted. The reduction of moisture in the soil takes toll on crops and animals. Agricultural drought is the first signal people witness when meteorological drought is happening. Hydrological drought This kind of drought manifests when there is evidently low water supply, more so in natural rivers and lakes, reservoirs, streams, and groundwater levels. Hydrological droughts occur after months of metrological droughts. Hydrological droughts stem from less precipitation, overreliance on these water sources for agriculture, energy requirements and other needs. Unlike meteorological droughts, hydrological droughts do not take place at the same time. This reduction in quantity and quality of surface water is a direct effect of meteorological drought. Socioeconomic drought This kind of drought is related to demand and supply. Supply of specific goods and services, for example, drinking water, food, and energy are impacted or threatened by shifts in hydrological and meteorological changes. This situation is sometimes compounded by rising population and explosion of demand for those goods and services to the degree that it leads to scramble for the little available water. This kind of drought takes a long time to become severe and equally long time to recover from it. Various Causes of Droughts Lack or insufficient rainfall or precipitation This is the major cause of droughts in most regions. A long-drawn-out period without rainfall can cause an area to dry out. The quantity of water vapor in the atmosphere pretty much impacts the precipitation of an area. When a region has moist and low-pressure systems, there is huge probability that rain, hail, and snow will occur. The exact opposite would happen when the region has high-pressure systems, and less water vapor. Farmers plant crops in anticipation of rains, and so when the rains fail, and irrigation systems are not in place, agricultural drought happens. Changes in climate Changes in climate , for instance, global warming can contribute to droughts. Global warming is likely to impact the whole world, especially third world economies. But scientists have proven, without doubt, that human activities are the main contributors to the increase in greenhouse gasses to the atmosphere. This increase in greenhouse gasses has resulted in warmer temperatures. Warmer temperatures are recipes for dryness and bushfires. These set of conditions mightily contribute to

prolonged droughts. Human activities Forests are critical components of the water cycle. They help store water, minimize evaporation, and contribute a great deal of atmospheric moisture in the form of transpiration. This, in essence, implies that deforestation , aimed at uplifting the economic status of a region, will expose vast quantities of water to evaporation. Cutting down trees will also take away the capability of the ground to retain water and allow desertification to occur easily. Deforestation also greatly minimizes watershed potential. Over-farming is another human activity contributing to droughts. Over-farming loosens the soil allowing erosion to take place. Soil erosion compromises the capacity of soil to hold water. Overexploitation of surface water resources Specific areas are endowed with surface water resources like rivers and streams whose sources are watersheds and mountains. These surface water resources could dry out if their main sources are interfered with. Irrigation systems and hydroelectric dams are just some of the aspects that contribute to over-exploitation of surface water resources. They also cut off supply of water to downstream communities. Harmful Effects of Droughts Economic Effects Economic effects of droughts usually involve loss of money by governments, enterprises, families or individuals. Below is an outline of the main economic impacts of droughts: Farmers will have to contend with spending huge sums of money for irrigation and watering animals. This involves drilling wells or buying water from far distances. Low yields equal loss of substantial income. Low yields also lead to pay cuts and layoffs to farm workers. Businesses and industries that produce farm equipment may close down since farmers have no money to purchase equipment. Prolonged shortage of rains means drier conditions. This makes an area susceptible to wildfires. Wildfires can destroy property; devastate farms and burn down forests. Governments spend millions to control or put out wildfires annually. All this affects the economy of the region. If water supply plummets, hydropower plants operate below capacity, and this means businesses have to pay more for electricity or incur the cost of using their own generators. Energy firms also lose out since they are unable to satisfy energy demands of the region. The government also loses a big chunk of tax revenue. Environmental Effects Droughts lead to decimation of habitats. Water bodies such as rivers, lakes, ponds, lagoons, and creeks dry out, and this leads to death of water animals. Soil moisture is critical to the breakdown of organic matter. Droughts compromise soil quality since there is less to zero organic activity because organisms have died. Droughts magnify the impacts of desertification by wiping out any chance of land recovering. The quality and health of surface water bodies such as rivers, streams, lakes, and ponds are enormously impacted. This endangers living organisms depending on the water for survival. Wildlife walk long distances in search of water. They end up in new dangerous habitats that can lead to their demise. Social Effects The social effects of drought are the most potent since they directly impact humans. Many in the third world countries that have experienced drought can attest to their severity. Water maintains our health. Sanitation and clean drinking water are critical to a healthy body. Droughts lead to malnutrition, anemia, and hunger. This means the area will lack young and working population, a critical ingredient to the development of any region. Lack of control over when the drought ends can have far-reaching psychological effects like stress, anxiety, and depression. Social interaction reduces and community networks get broken.