Fields	Content	Comments
Topic	Changing Climate, Water and People	
Sub-topic	N/A	
Skills/knowledge accessed/developed	Basics of global warming, climate change and its effect on livelihoods and communities	
Prior learning required	Students have attended/completed sessions on - Water Cycle Water and Climate	
Learning objectives	• Students understand what is causing the current change in climate and why it is a matter of concern at a global and a local level • Students examine their own lives to identify how they are influenced by the changing climate • Students will discuss and identify ways to mitigate effects to climate change individually, as a family and as a community	
Specific learning outcomes	1. Students are able to observe and articulate the influences of a changing climate in their lives 2. Students are able to conduct discussions to define climate risks and suggest possible solutions 3. Students realise that solutions can be developed at individual, family, community, institutional and governmental levels	
Use of teaching time	10 mins The facilitator can revise the sessions on Water Cycle and Water and Climate. For example, they can ask the students the following question: 1. Name a few stocks and flows and how they are connected. 2. What is the difference between weather and climate? 3. Discuss how water cycle and climate are related. 10 mins	

	Facilitators will discuss what a changing climate means. The facilitator will discuss a few natural and human-made factors that can lead to change in climate. (Refer to section *Background content*) 15 mins The facilitator will discuss why the current climate change (esp. global warming) is a matter of global concern. The facilitator will then give the examples of droughts and floods in Burkina Faso as the local examples of a changing climate. They may explain the devastation that happened during the flood in 2009. (Refer to section *Background content*) 5 min The facilitator will invite the students to give examples where they think climate change is affecting their lives. Facilitator may share examples from their experience or those mentioned in the section *Background content* Note: It is possible that the stories may be upsetting for the students and they may not wish to share. So its good for the facilitator to be ready with 1-2 stories to share. This may encourage the students to share. The facilitator should only nudge the students to share these stories, and not make it compulsory. 20 mins The facilitator will divide students into groups of 2-5 and conduct Activity 1. Each group will be given a character (See the section *Methods and materials*). The groups will describe the situation of the character and address the given questions. Students will make a note of the discussion and prepare to present to all the participants. 20 mins Each group will present their discussions and	

	solutions. The facilitator will moderate the Q&As. 20 mins The facilitator will describe some of the interventions implemented in different parts of Burkina Faso. They will discuss with each group if they can implement this intervention in their specific scenario. (refer to the section *Background content*) Total time - 2 hours	
Methods and materials	Activity 1 Character 1 Name - Faride Situation - Faride (28 years old) lives 500 m away from the river Nakambe with his wife (25 years old), his mother who is 80 years old and his son who is 2 years old. This is close to the factory where Faride works. Several of his coworkers live in the same area. The river used to flood once in 10-12 years close to where they live. But the last 3 rainy seasons, the river has flooded every year. Faride and his family are concerned that it is getting less safe for them to live where they are. Group discussion - What should Faride and his wife do to keep their family safe? Hints: 1. What kind of information do they need and who can provide it? 2. What can they do as a family and as a community? Character 2- Name - Alassane Situation - Alassane owns a small piece of land where he grows millets. He is able to produce enough in a year to feed himself and sell in the local market for 3 months. In his part of the village, there are two other small farmers and one big farmer. They all draw water from the nearby lake that is fed by underground springs and seasonal rainfall. In the past two years, rainfall has been lesser than before and the lake is drying up.	

	How should Alassane plan for this year's crop? Hints: What solutions and alternatives does Alassane need to consider? Is it possible for the four farmers to come together as a group and find solutions? Elaborate your answer. Character 3 - Name - Daniela Situation - Daniela owns a small piece of land near the river. The river flooded for the last two years and destroyed a lot of her crops and killed several of her animals. She wants to plan the growing season such that she can minimise her losses - both for crops and for animals. What should Daniela do? Hints: 1. What information should she search for? 2. What kind of crop should she plan for? 3. Where should she keep her animals? Character 4 - Name - Mariam Situation - Mariam used to live close to the river Nakambe. She used to collect herbs and flowers from the river bank and sell them in the market. Two years ago when the river flooded, her house was destroyed and she and her son had to move in with her sister, Fatimata, living a little further from the river. Mariam's son, Moussa, is a brick-layer. With two additional family members living with them, Fatimata is facing water shortages in her home. In what ways can Mariam help her sister deal with the lack of water at home? Hints: 1. Fetching more water 2. Building systems within the house to store more water	
Background content	<u>Changing Climate and Water</u> When we are talking about climate change, we are talking about changes in *long-term* averages of daily weather. In most places, weather can change from	

	minute-to-minute, hour-to-hour, day-to-day, and season-to-season. Climate, however, is the average of weather over time and space. The World Meteorological Organisation defines climate normals over 30 years. Burkina Faso's *Direction Générale de la Météorologie* provides the 30-year normals for reporting and also provides seasonal bulletins that reflect the most recent 10–15 years. These rolling averages over shorter duration are used for operation planning in the fast-changing climate and can benefit water resource management, health authorities, educators and farmers. The global climate has always been in a state of flux. However, it is changing much faster now than it has in the past, and this time human activities are involved. Global warming is a type of climate change, and it is already having a measurable effect on the planet in the form of melting Arctic sea ice, retreating glaciers, rising sea levels, increased frequency and intensity of extreme weather events, and a change in animal and plant ranges. The planet has already heated by at least 1.1°C, and temperatures have continued to rise. Global warming can disrupt the water cycle and cause harmful effects to human societies as well as ecosystems. Increasing temperatures will melt glaciers and ice sheets, increasing the flow of water in rivers and to oceans. This causes rise in sea level which can drown areas close to the coast as well as cause flooding in rivers. Increasing temperatures also cause an increase in evaporation of water from various surface stocks of water. This can dry wells and lakes. Global warming also increases the likelihood of heavy rainfall which results in floods and reduced percolation of water into underground aquifers. This can reduce the amount of groundwater which is a source of water during the dry season. On the other hand, during a drought, a lake may dry up, and therefore, evaporation and river flow reduces. This reduces the amount of water entering the atmosphere and the ocean. This can in turn reduce rain and snowfall and further	

	reduce water in lakes and glaciers, thus affecting the water cycle. These changes in reservoirs and flows will affect human activities which would have been adapted to expect a certain climate. Due to change in climate, weather at a particular location will change and human activities such as agriculture faces dramatic changes. Such changes can bring about catastrophic alterations to the local and global ecosystems. <u>Changing Climate and Agriculture in Burkina Faso</u> Global warming has been affecting agricultural production negatively in West Africa over the past 20 years. While many studies have indicated a drop in regional agricultural yields of 10 to 15% by 2050 due to the future rise in temperatures, none have considered the impact of historical warming. The result is unambiguous; anthropogenic activities have caused a drop in yields of 10-20% in millet, and of 5-15% in sorghum. From an economic point of view, the losses for the countries involved range from 2 to 4 billion dollars for millet and 1 to 2 billion dollars for sorghum. These losses in yield will grow in the future if global greenhouse gas emissions are not reduced, and if adaptations to higher temperatures are not implemented. Whilst Burkina Faso suffers annual flooding during the rainy season, unusually severe rains on 1 September 2009 when 263mm fell in 12 hours (according to the Burkina Faso Meteorological Department) caused widespread displacement within and around the capital, Ouagadougou. Floods have also occurred in neighboring countries with an estimated 600,000 people affected in the West African region. The Government reported that all five districts of Ouagadougou had been affected and that 8 people have died. The fire service report that 50% of the city's territory has been affected. According to the most recent assessment an estimated 48,000 people were	

	sheltering in temporary accommodation such as schools, churches and public buildings. In many buildings the capacity is severely overstretched (especially sanitation). It is believed that the number of people staying with host families has significantly increased to at least 40,000. There is a need to ensure schools are vacated before the school year starts on 1 October. Key infrastructure damaged includes: - Central University Hospital - Bridges and roads - Schools - Agricultural lands were damaged to the point it was difficult to grow crops on them. The type of seeds used in the country do not survive a lot of water. About 400 hectares of crops were flooded and 200 lost that day. A lot of pipes and irrigation systems were destroyed or damaged, and about 8000 farmers were directly or indirectly affected by the flood. Farmers were impacted by soil erosion, waterlogging and infrastructure damage. In fact, fast-moving water stripped away the fertile topsoil, which is essential for crop growth. Once lost, the soil takes years or even decades to rebuild.About 5000 hectares were destroyed and 15,000 farmers were impacted by the flood.	

https://web.facebook.com/share/p/1AnDjnYaWX/

https://www.sidwaya.info/inondations-du-1er-septembre-2009-un-douloureux-souvenir/

- One electrical plant and one of the main water purification plants for the city are out of use but needs are being covered by other plants.

A famous TV actor of one the best TV series in Burkina Faso - Zami Guebre Roger - had his house destroyed during the 2009 flood. Interviewed on national television, he explained that his family was sleeping when they noticed water sounds in the

	kitchen, so his wife had to check and report to him that the roof was sinking and she shared that she was scared that the structure could not last the whole night. Then he woke up to check if everything was ok from outside, then he noticed that their house was the only one still standing in their neighborhood. That's when he realized that they had to evacuate quickly. They packed only essential stuff and tried to find a way to the police station. They went back the next day in the afternoon and nothing was remaining except the walls. It was a sad moment that impacted the whole country because he was one of the most appreciated and loved actors at that time. In the heart of Garango, farmer Mamoudou watched dark clouds gather over his maize fields. The rain began with a whisper, then roared for hours, turning soil to rivers. His crops, nearly ready for harvest, were swallowed whole by the flood. Water rushed through his village, sweeping away goats, tools, and the little he owned. Mamoudou's children clung to him as they sought shelter on higher ground. When the skies cleared, all that remained was mud and silence. The fertile earth had turned sour, soaked in stagnant water and sorrow. Still, he gathered the seeds he had saved in a jar buried beneath his hut. With neighbors, he cleared the land, planting again with hands worn but steady. For Mamoudou, hope was not a luxury—it was a way of life. https://web.facebook.com/share/v/1C1BG3GYPN/ <u>Examples of interventions implemented in Burkina Faso</u> <u>Rainwater Harvesting:</u> Collected and stored rainwater for use in irrigation, drinking, and sanitation can reduce reliance on freshwater sources. This is	

	implemented in some communities or at the household level in the south of the country, especially the south-west part of Burkina Faso. Bobo Dioulasso, the second city of the country, has a regional program aiming to store the 2.366 mm of rainfall per year. Before this program about ⅔ of rainwater was lost every year; now only 20% is lost. https://www.oxfam.org/en/down-waterway-quest-water-burkina-faso?utm_source=chatgpt.com Drip Irrigation: This method delivers water directly to the plant roots, minimizing evaporation and runoff. It's more efficient than traditional flood irrigation and is vital in arid regions like the north of the country (Sahel). Water Recycling and Reuse: Using treated wastewater for non-potable purposes (e.g., irrigation, industrial processes) reduces the overall demand for fresh water. Advanced filtration systems can even make wastewater safe for drinking which is yet to be implemented in many regions. Water-Efficient Technologies: Installing water-efficient appliances, such as low-flow toilets, faucets, and irrigation systems, significantly reduced water usage, especially in urban areas. Since 2010 the government of Burkina Faso launched “ECOLAT” a technology based on the pit which contains filter materials and bio-enzymatic fibers allowing an acceleration of the process of biodegradation of fecal matter. https://www.undp.org/fr/burkina-faso/blog/ecolat-ou-les-toilettes-mobiles-pour-tous-et-partout Additional Resources https://www.noaa.gov/education/resource-collections/freshwater/water-cycle	

	https://earthobservatory.nasa.gov/world-of-change/global-temperatures	