

**Supplementary Table 2. Topics generated by Gemini.**

Gemini: Response 1	Gemini: Response 2	Gemini: Response 3	Gemini: Response 4	Gemini: Response 5
<p><b>Proposed Topics for Climate Change Adaptation Education in a South African Geography FET Curriculum</b></p> <p>Given South Africa's unique geographical context and vulnerabilities to climate change, the following topics could be included in a new Geography FET curriculum:</p> <p><b>1. Understanding Climate Change and Its Impacts</b></p> <p><b>Causes and effects of climate change:</b> Natural and anthropogenic factors, greenhouse gas emissions, and the impacts on various ecosystems.</p> <p><b>Climate change projections for South Africa:</b> Regional variations in temperature and precipitation patterns, sea-level rise, and extreme weather events.</p> <p><b>Vulnerability and resilience:</b> Identifying regions and communities at high risk and exploring strategies for building resilience.</p>	<p>Here's a list of topics for a <b>Proposed Topics for Climate Change Adaptation Education in South Africa's Geography Further Education and Training Phase Curriculum Understanding Climate Change:</b></p> <p><b>1. Understanding Climate Change</b></p> <p><b>Causes and effects of climate change:</b> Natural vs. human-induced factors, greenhouse gas emissions, and the impacts on various ecosystems.</p> <p><b>Climate change trends in South Africa:</b> Historical and projected climate patterns, including temperature increases, rainfall variability, and extreme weather events.</p>	<p><b>Proposed Topics for Climate Change Adaptation Education in South Africa's Geography Further Education and Training Phase Curriculum</b></p> <p>Given South Africa's unique geographical context and vulnerability to climate change, the following topics are essential for inclusion in a new Geography curriculum:</p> <p><b>1. Understanding the Impacts of Climate Change in South Africa</b></p> <p><b>Extreme Weather Events:</b> Droughts, floods, heatwaves, and storms.</p> <p><b>Rising Sea Levels:</b> Coastal erosion, saltwater intrusion.</p> <p><b>Changes in Agricultural Patterns:</b> Crop failures, livestock stress.</p> <p><b>Biodiversity Loss:</b> Habitat destruction, species extinction.</p> <p><b>Social and Economic Impacts:</b> Displacement, poverty, inequality.</p>	<p><b>Proposed Topics for Climate Change Adaptation Education in South Africa's Geography Curriculum</b></p> <p>Given the pressing nature of climate change in South Africa, incorporating climate change adaptation into the Geography Further Education and Training Phase curriculum is crucial. Here's a suggested list of topics:</p> <p><b>1. Understanding Climate Change</b></p> <p><b>Causes and Effects:</b> Greenhouse gases, global warming, climate patterns, sea-level rise, extreme weather events.</p> <p><b>South African Context:</b> Unique vulnerabilities, impacts on ecosystems, communities, and infrastructure.</p>	<p><b>Proposed Topics for Climate Change Adaptation Education in South Africa's Geography Further Education and Training Phase Curriculum</b></p> <p>Given South Africa's unique geographical context and vulnerabilities to climate change, the following topics are essential for inclusion in a new Geography Further Education and Training Phase curriculum:</p> <p><b>1. Understanding Climate Change and Its Impacts</b></p> <p><b>Historical Climate Data and Trends:</b> Analysis of historical climate data to identify long-term trends and patterns.</p> <p><b>Projected Climate Change Scenarios:</b> Exploration of various climate models and their predictions for South Africa.</p> <p><b>Impacts of Climate Change:</b> Examination of the potential impacts on ecosystems, agriculture, water resources, coastal areas, and human health.</p>

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<p><b>2. Adaptation Strategies and Technologies</b></p> <p><b>Integrated coastal zone management:</b> Protecting coastal communities from sea-level rise and erosion.</p> <p><b>Water resource management:</b> Sustainable water use practices, rainwater harvesting, and desalination technologies.</p> <p><b>Agriculture and food security:</b> Drought-resistant crops, irrigation systems, and sustainable farming practices.</p> <p><b>Urban planning and infrastructure:</b> Climate-resilient infrastructure, green spaces, and urban heat island mitigation.</p> <p><b>3. Community-Based Adaptation and Climate Justice</b></p> <p><b>Traditional knowledge and practices:</b> Incorporating indigenous knowledge systems into adaptation strategies.</p> <p><b>Community-led initiatives:</b> Empowering local communities to develop and implement adaptation plans.</p>	<p><b>2.Climate Change Impacts and Risks</b></p> <p><b>Vulnerability and resilience:</b> Assessing the susceptibility of different regions and communities to climate change impacts, and strategies for building resilience.</p> <p><b>Extreme weather events:</b> Understanding and preparing for floods, droughts, heatwaves, and storms.</p> <p><b>Impacts on agriculture, water resources, and biodiversity:</b> Examining the effects of climate change on key sectors and ecosystems.</p> <p><b>3. Adaptation Strategies and Solutions</b></p> <p><b>Sustainable land use and management:</b> Promoting practices such as reforestation, afforestation, and conservation agriculture.</p> <p><b>Water resource management:</b> Implementing efficient water use practices, rainwater harvesting, and wastewater treatment.</p>	<p><b>2. Adaptation Strategies and Technologies</b></p> <p><b>Water Resource Management:</b> Conservation, rainwater harvesting, desalination.</p> <p><b>Agriculture and Food Security:</b> Drought-resistant crops, sustainable farming practices.</p> <p><b>Infrastructure Development:</b> Climate-proof buildings, transportation systems.</p> <p><b>Disaster Risk Reduction:</b> Early warning systems, evacuation plans.</p> <p><b>Renewable Energy:</b> Solar, wind, hydropower.</p> <p><b>3. Climate Change Mitigation and Policy</b></p> <p><b>Global Climate Agreements:</b> Paris Agreement, COP meetings.</p> <p><b>South Africa's National Climate Change Response:</b> Policies, targets.</p> <p><b>Carbon Emissions Reduction:</b> Clean energy technologies, sustainable practices.</p>	<p><b>2. Adaptation Strategies</b></p> <p><b>Infrastructure Adaptation:</b> Building codes, flood control, coastal protection, renewable energy.</p> <p><b>Ecosystem-Based Adaptation:</b> Conservation, restoration, and sustainable land management.</p> <p><b>Social and Economic Adaptation:</b> Community resilience, disaster preparedness, livelihood diversification.</p> <p><b>3. Climate Modeling and Forecasting</b></p> <p><b>Climate Models:</b> Understanding their limitations and applications.</p> <p><b>Scenario Planning:</b> Assessing potential future climate conditions and impacts.</p> <p><b>Early Warning Systems:</b> Developing and implementing systems for timely alerts.</p>	<p><b>Vulnerability Assessment:</b> Assessing the vulnerability of different regions and communities to climate change.</p> <p><b>2. Adaptation Strategies and Solutions</b></p> <p><b>Adaptation Planning:</b> Introduction to adaptation planning processes and strategies.</p> <p><b>Sustainable Land Use Practices:</b> Exploring sustainable land use practices, such as reforestation, afforestation, and soil conservation.</p> <p><b>Water Resource Management:</b> Strategies for managing water resources effectively in a changing climate.</p> <p><b>Coastal Protection:</b> Measures to protect coastal areas from rising sea levels and storm surges.</p> <p><b>Disaster Risk Reduction:</b> Strategies for reducing the impact of climate-related disasters.</p> <p><b>Community-Based Adaptation:</b> The role of communities in implementing adaptation measures.</p>

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<p><b>Climate justice and equity:</b> Addressing the disproportionate impacts of climate change on marginalized communities.</p> <p><b>4. Policy and Governance</b></p> <p><b>National climate change policies and strategies:</b> Analyzing South Africa's climate change response and its effectiveness.</p> <p><b>International climate agreements:</b> Understanding the role of international cooperation in addressing climate change.</p> <p><b>Governance and institutional arrangements:</b> Assessing the effectiveness of government agencies and institutions in implementing adaptation measures.</p> <p><b>5. Climate Change Communication and Education</b></p> <p><b>Effective communication strategies:</b> Engaging with diverse audiences and promoting climate change awareness.</p>	<p><b>Disaster risk reduction:</b> Developing early warning systems, evacuation plans, and disaster response strategies.</p> <p><b>Community-based adaptation:</b> Engaging local communities in climate change adaptation initiatives.</p> <p><b>Technological innovations:</b> Exploring new technologies for climate adaptation, such as solar power, energy efficiency, and climate-smart agriculture.</p> <p><b>4. Policy and Governance</b></p> <p><b>Climate change policies and regulations:</b> Understanding national and international policies related to climate change adaptation.</p> <p><b>Role of government and civil society:</b> Examining the responsibilities of different stakeholders in addressing climate change.</p> <p><b>Climate finance:</b> Exploring sources of funding for climate adaptation projects.</p>	<p><b>Climate Justice:</b> Equity and fairness in climate action.</p> <p><b>4. Community-Based Adaptation</b></p> <p><b>Local Knowledge and Practices:</b> Traditional coping mechanisms.</p> <p><b>Community-Led Initiatives:</b> Climate-resilient communities.</p> <p><b>Participatory Planning:</b> Involvement of local stakeholders.</p> <p><b>5. Case Studies of Climate Change Adaptation in South Africa</b></p> <p><b>Successful Examples:</b> Lessons learned, best practices.</p> <p><b>Challenges and Failures:</b> Identifying pitfalls and areas for improvement.</p> <p><b>6. Climate Change Communication and Education</b></p> <p><b>Effective Communication:</b> Using various media to reach different audiences.</p>	<p><b>4. Climate Change Governance and Policy</b></p> <p><b>International Agreements:</b> Paris Agreement, Sustainable Development Goals.</p> <p><b>National Policies:</b> South Africa's climate change policies and strategies.</p> <p><b>Local Governance:</b> Role of municipalities in adaptation planning and implementation.</p> <p><b>5. Climate Justice and Equity</b></p> <p><b>Vulnerable Communities:</b> Identifying and addressing the needs of marginalized groups.</p> <p><b>Intergenerational Equity:</b> Balancing the needs of present and future generations.</p> <p><b>Climate Migration:</b> Understanding the challenges and opportunities associated with climate-induced displacement.</p>	<p><b>3. Policy and Governance</b></p> <p><b>Climate Change Policy:</b> Analysis of South Africa's national and international climate change policies.</p> <p><b>Governance and Institutional Arrangements:</b> Examining the roles of different government departments and institutions in climate change adaptation.</p> <p><b>Climate Finance:</b> Understanding the sources and allocation of climate finance.</p> <p><b>International Cooperation:</b> Exploring international frameworks and agreements related to climate change adaptation.</p> <p><b>4. Technology and Innovation</b></p> <p><b>Climate Technologies:</b> Introduction to technologies that can support climate change adaptation, such as renewable energy, energy efficiency, and early warning systems.</p>

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<p><b>Role of media and social media:</b> The impact of media coverage on public understanding and behavior.</p> <p><b>Climate change education in schools and communities:</b> Developing educational programs and resources.</p> <p><b>6. Case Studies and Fieldwork</b></p> <p><b>Local and regional case studies:</b> Examining successful and unsuccessful adaptation projects.</p> <p><b>Field trips and hands-on activities:</b> Providing students with practical experience in climate change research and monitoring.</p> <p>By incorporating these topics into the Geography FET curriculum, South African students can develop a deeper understanding of climate change, its impacts, and the potential solutions.</p>	<p><b>5. Ethical and Social Dimensions</b></p> <p><b>Climate justice:</b> Considering the unequal impacts of climate change on different communities and the need for equitable adaptation.</p> <p><b>Intergenerational equity:</b> Addressing the ethical implications of climate change for future generations.</p> <p><b>6. Case Studies and Fieldwork</b></p> <p><b>Local and regional case studies:</b> Analyzing successful and unsuccessful climate adaptation initiatives in South Africa.</p> <p><b>Fieldwork opportunities:</b> Incorporating hands-on experiences to enhance understanding of climate change impacts and adaptation measures.</p>	<p><b>Public Awareness Campaigns:</b> Promoting climate change awareness and action.</p> <p><b>Climate Change Education in Schools:</b> Integrating climate change into the curriculum</p> <p><b>7. Climate Change and Sustainable Development</b></p> <p><b>Interconnectedness:</b> Climate change and sustainable development goals.</p> <p><b>Sustainable Development Practices:</b> Promoting economic growth, social equity, and environmental protection.</p> <p>By incorporating these topics into the Geography curriculum, South Africa can equip its youth with the knowledge and skills necessary to address the challenges of climate change and build a more resilient future.</p>	<p><b>6. Citizen Science and Community Engagement</b></p> <p><b>Data Collection:</b> Involving communities in monitoring climate change impacts.</p> <p><b>Local Solutions:</b> Fostering community-led adaptation initiatives.</p> <p><b>Climate Education:</b> Promoting awareness and understanding among the public.</p> <p><b>7. Case Studies of Adaptation Successes and Failures</b></p> <p><b>National and International Examples:</b> Learning from experiences in other countries.</p> <p><b>South African Case Studies:</b> Analyzing the effectiveness of adaptation measures.</p> <p><b>8. Emerging Technologies and Innovations</b></p> <p><b>Climate Technology:</b> Exploring new tools and methods for adaptation.</p>	<p><b>Innovation and Entrepreneurship:</b> The role of innovation and entrepreneurship in developing climate-resilient solutions.</p> <p><b>5. Case Studies and Local Examples</b></p> <p><b>South African Case Studies:</b> Analysis of successful climate change adaptation initiatives in South Africa.</p> <p><b>International Case Studies:</b> Examining adaptation strategies implemented in other countries with similar challenges.</p> <p>By incorporating these topics into the Geography Further Education and Training Phase curriculum, South African students can develop a comprehensive understanding of climate change, its impacts, and the strategies needed to build a more resilient society.</p>

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<p>This knowledge will equip them to become informed and engaged citizens who can contribute to building a more resilient and sustainable future.</p>	<p>By incorporating these topics into the Geography Further Education and Training Phase curriculum, learners can develop a comprehensive understanding of climate change, its impacts, and the strategies necessary for building a more resilient and sustainable future.</p>		<p><b>Green Infrastructure:</b> Utilizing nature-based solutions for climate resilience.</p> <p>By incorporating these topics into the Geography curriculum, South African students can develop a comprehensive understanding of climate change, its impacts, and the strategies necessary for building a resilient future.</p>	