OYSIPA

OYO STATE INVESTMENT AND PUBLIC PRIVATE PARTNERSHIP AGENCY

CLIMATE SCREENING ASSESSMENT FOR PPP PROJECTS

Table of Contents

Climate Risk Assessment for Bola Ige International Market Redevelopment Project (PPP)

Section 1: Project Information

1. **Project Name:** Bola Ige International Market Redevelopment Project
2. **Location:** Ibadan, Oyo State, Nigeria
3. **Sector/Category:** Infrastructure (Market Redevelopment)
4. **Estimated Cost:** ₦350,800,609.20
5. **Expected Duration:** 2-4 years, depending on the project scope and implementation phases.

Section 2: Climate-Related Risks

1. **Climate-Related Risks Identified:**
    - **Flooding:** Heavy rainfall and poor drainage systems in Ibadan could lead to flooding, especially during the rainy season.
    - **Heat Stress:** Rising temperatures could increase the demand for cooling systems and affect comfort and safety in public spaces, especially in market areas.
    - **Storms and Wind Damage:** Strong winds, particularly from seasonal storms, could damage structures, causing disruption.
    - **Water Scarcity:** Drought or reduced water availability could affect sanitation and water supply systems within the market.
    - **Soil Erosion and Ground Stability:** Construction in areas prone to soil erosion could undermine the structural integrity of the market infrastructure.
2. **Likelihood of Climate-Related Risks Occurring:**
    - **Flooding:** Likely, especially in areas with poor drainage infrastructure.
    - **Heat Stress:** Very likely, as global temperatures rise and urban heat islands develop.
    - **Storms and Wind Damage:** Likely, as extreme weather patterns increase in frequency.

- **Water Scarcity:** Possible, depending on regional rainfall and water management strategies.
- **Soil Erosion and Ground Stability:** Moderate likelihood, especially in areas with unstable soil types.

3. **Potential Impacts of Climate-Related Risks on the Project:**
    - **Flooding:** Can damage infrastructure, disrupt market operations, and impact health and safety.
    - **Heat Stress:** Reduces the comfort of market users and increases energy demand for cooling systems.
    - **Storms and Wind Damage:** Structural damage, disruption of market activities, and increased maintenance costs.
    - **Water Scarcity:** Shortage of water for sanitation and cooling systems, affecting the cleanliness and operational sustainability of the market.
    - **Soil Erosion and Ground Stability:** Risk of foundation damage and construction delays.
4. **Existing Measures to Mitigate Climate-Related Risks:**
    - **Flooding:** The market redevelopment plans include improved drainage systems and flood barriers around the facility.
    - **Heat Stress:** Passive design strategies (e.g., using shading extensions, proper ventilation designs) and the use of cool roofing materials to reduce heat absorption.
    - **Storms and Wind Damage:** Enhanced structural design to withstand high winds, including wind-resistant roofing and reinforced walls.
    - **Water Scarcity:** Incorporating rainwater harvesting systems and water-efficient fixtures.
    - **Soil Erosion and Ground Stability:** Conducting geotechnical surveys and using erosion control techniques, such as retaining walls and proper land grading.

Section 3: Climate-Related Opportunities

1. **Climate-Related Opportunities Identified:**

- **Renewable Energy:** Solar power systems to reduce reliance on the grid and provide energy for market operations.
- **Climate-Resilient Infrastructure:** Using sustainable materials and green infrastructure to reduce environmental impacts.
- **Water Management:** Incorporating rainwater harvesting and greywater recycling to reduce water usage.
- **Urban Green Spaces:** Creating green zones within the market to promote biodiversity and provide shade.
- **Covered Walkways/Spaces:** Creating covered walkways and spaces within the market to provide shade and ease navigation.

2. **Likelihood of Climate-Related Opportunities Occurring:**
   - **Renewable Energy:** Likely, especially with government incentives for clean energy.
   - **Climate-Resilient Infrastructure:** Likely, given the growing focus on sustainability.
   - **Water Management:** Likely, particularly with increasing awareness of water conservation.
   - **Urban Green Spaces:** Likely, as designs are been adapted to match this requirement.
   - **Covered Walkways/Spaces:** Likely, as designs are been adapted to match this requirement.
3. **Potential Benefits of Climate-Related Opportunities:**
   - **Renewable Energy:** Reduces long-term energy costs and lowers carbon emissions.
   - **Climate-Resilient Infrastructure:** Enhances the longevity and sustainability of the market structure.
   - **Water Management:** Ensures a sustainable water supply and reduces reliance on external sources.
   - **Urban Green Spaces:** Improves air quality, provides aesthetic value, and enhances comfort for users.

- **Covered Walkways/Spaces:** Provides aesthetic value, and enhances comfort for users.

4. **Existing Measures to Take Advantage of Climate-Related Opportunities:**
    - **Renewable Energy:** The design includes the installation of solar panels to supplement the energy needs of the market.
    - **Climate-Resilient Infrastructure:** Sustainable building materials (e.g., low-carbon cement, recycled steel) are being considered.
    - **Water Management:** Rainwater harvesting and water-efficient systems are incorporated into the design.
    - **Urban Green Spaces:** Plans for landscaping and planting trees in communal areas to provide shade and mitigate heat.
    - **Covered Walkways/Spaces:** Sustainable building materials (e.g., low-carbon cement, recycled steel) are being considered.

Section 4: Climate Resilience and Adaptation

1. **Measures to Ensure Project Resilience to Climate-Related Risks:**
    - **Flood-Resilient Infrastructure:** Elevated ground floors and flood-resistant design elements.
    - **Energy Efficiency:** Implementing energy-efficient designs and technologies to mitigate the effects of heat stress.
    - **Storm Preparedness:** Designing structural components to withstand high winds and heavy rainfall.
    - **Water Conservation:** Installing low-flow fixtures and systems to recycle water and reduce demand.
2. **Plans to Adapt to Future Climate-Related Risks:**
    - **Ongoing Climate Risk Assessments:** Periodic assessments of climate risks to adjust adaptation strategies as needed.
    - **Scalable Infrastructure:** Incorporating scalable solutions like adjustable green spaces and water systems to accommodate future climate changes.

3. **Monitoring and Evaluation to Ensure Climate Resilience and Adaptation:**
    - **Climate Monitoring:** Continuous monitoring of weather patterns, including rainfall and temperature trends.
    - **Performance Audits:** Regular performance audits of water management systems, energy consumption, and stormwater systems.
    - **Stakeholder Feedback:** Engaging local communities and stakeholders for input on climate adaptation measures.

Section 5: Stakeholder Engagement

1. **Stakeholder Engagement in Climate Risk Management:**
    - **Incorporation of Local Expertise:** Engaging local environmental experts, engineers, and community leaders to ensure that climate risks are properly addressed in the project.
    - **Public Awareness Campaigns:** Raising awareness about the climate resilience features of the redevelopment project among market vendors and users.
2. **Communication of Climate-Related Risks and Opportunities:**
    - **Workshops and Briefings:** Regular workshops and briefings for stakeholders to communicate identified risks and opportunities, especially during planning and construction phases.
3. **Plans to Engage Stakeholders in the Project's Climate Resilience and Adaptation Efforts:**
    - **Stakeholder Collaboration:** Establishing a collaborative climate resilience task force comprising local authorities, market representatives, environmental experts, and community leaders to monitor progress and address concerns.

Section 6: Additional Information

1. **Other Climate-Related Risks or Opportunities:**
    - **Heat Island Effect:** The redevelopment could address urban heat island effects through green roofs and expanded tree canopies.

- **Social Resilience:** Strengthening community networks to adapt to climate stressors, which could be integrated into the redevelopment planning.

2. **Additional Comments/Suggestions:**
    - **Sustainability Goals:** The project could align with broader sustainability goals of Oyo State by integrating renewable energy, water conservation, and green spaces.
    - **Innovation in Design:** Explore innovative building designs that integrate environmental sustainability with the social and economic needs of the market community.

Climate Risk Assessment for Yekini Adeojo Government Residential Reserved Area Project (PPP)

Section 1: Project Information

1. **Project Name:** Yekini Adeojo Government Residential Reserved Area Project
2. **Location:** Ibadan, Oyo State, Nigeria
3. **Sector/Category:** Infrastructure/Real Estate (Residential Development)
4. **Estimated Cost:** ₦15,000,000,000.00.
5. **Expected Duration:** 2-3 years, depending on the scope and implementation phases.

Section 2: Climate-Related Risks

1. **Climate-Related Risks Identified:**
    - **Flooding:** Ibadan and surrounding areas are prone to flooding due to inadequate drainage systems, particularly during the rainy season.
    - **Heat Stress:** Rising temperatures in urban areas, combined with the "urban heat island" effect, may create uncomfortable living conditions.
    - **Drought:** Changes in rainfall patterns may cause water shortages, which could affect water supply and sanitation infrastructure.
    - **Soil Erosion:** Heavy rainfall and lack of proper land management could result in soil erosion, undermining the foundation of buildings.
    - **Storms and Wind Damage:** Extreme weather events such as storms and high winds may damage infrastructure and delay construction.
2. **Likelihood of Climate-Related Risks Occurring:**
    - **Flooding:** Likely, especially in low-lying areas without proper drainage systems.
    - **Heat Stress:** Likely, particularly with increasing urbanization and climate change trends.
    - **Drought:** Possible, with changes in seasonal rainfall patterns and water availability.

- **Soil Erosion:** Moderate likelihood, especially in areas with poor land management or steep slopes.
- **Storms and Wind Damage:** Likely, due to the increasing frequency of extreme weather patterns.

3. **Potential Impacts of Climate-Related Risks on the Project:**
    - **Flooding:** Damage to infrastructure, disruption of construction, and loss of lives or property.
    - **Heat Stress:** Reduced comfort and quality of living for residents, increased demand for cooling, and higher energy consumption.
    - **Drought:** Water scarcity could affect daily life and basic sanitation needs.
    - **Soil Erosion:** Instability of the ground, leading to foundation damage or construction delays.
    - **Storms and Wind Damage:** Potential damage to buildings, delays in construction, and additional maintenance costs.
4. **Existing Measures to Mitigate Climate-Related Risks:**
    - **Flooding:** Incorporating effective drainage systems, elevating infrastructure to mitigate flooding, and creating flood barriers in vulnerable areas.
    - **Heat Stress:** Designing energy-efficient buildings with adequate ventilation, using cool roofing materials, and planting trees for shade and natural cooling.
    - **Drought:** Implementing water-efficient infrastructure, rainwater harvesting systems, and utilizing wastewater treatment for non-potable uses.
    - **Soil Erosion:** Conducting geotechnical assessments to ensure stable foundations and using erosion control methods like retaining walls and vegetation.
    - **Storms and Wind Damage:** Using storm-resistant materials, reinforced structures, and designing roofs that can withstand high winds.

Section 3: Climate-Related Opportunities

1. **Climate-Related Opportunities Identified:**
    - **Renewable Energy:** Solar panels and energy-efficient infrastructure to reduce the project's carbon footprint and reliance on the national grid.
    - **Climate-Resilient Infrastructure:** Building homes and public facilities with sustainable materials and incorporating green technologies.
    - **Water Management:** Integrating rainwater harvesting and water conservation technologies to minimize reliance on local water supply systems.
    - **Urban Green Spaces:** Designing green areas within the development to combat heat island effects, improve air quality, and enhance community well-being.
2. **Likelihood of Climate-Related Opportunities Occurring:**
    - **Renewable Energy:** Likely, as solar energy technology becomes more accessible and affordable.
    - **Climate-Resilient Infrastructure:** Likely, with increasing awareness and support for sustainable construction practices.
    - **Water Management:** Likely, given the growing importance of water conservation and efficient management in urban development.
    - **Urban Green Spaces:** Likely, depending on available space and the project's commitment to sustainability.
3. **Potential Benefits of These Climate-Related Opportunities for the Project:**
    - **Renewable Energy:** Reduced energy costs, lower carbon emissions, and enhanced sustainability.
    - **Climate-Resilient Infrastructure:** Increased longevity of the project, reduced maintenance costs, and enhanced marketability as a sustainable development.

- **Water Management:** Reduced strain on local water resources, ensuring long-term water availability for residents and businesses.
- **Urban Green Spaces:** Improved air quality, aesthetics, mental health benefits for residents, and reduction of urban heat island effects.

4. **Existing Measures to Take Advantage of Climate-Related Opportunities:**
    - **Renewable Energy:** Plans to integrate solar panels on buildings, streetlights, and other communal spaces to reduce reliance on external energy sources.
    - **Climate-Resilient Infrastructure:** Using low-carbon, durable materials and incorporating energy-efficient designs and technologies.
    - **Water Management:** Incorporating rainwater harvesting systems and water-saving technologies such as low-flow toilets and water-efficient landscaping.
    - **Urban Green Spaces:** Integrating parks, gardens, and green roofs into the development plans to enhance livability and environmental sustainability.

Section 4: Climate Resilience and Adaptation

1. **Measures to Ensure Project Resilience to Climate-Related Risks:**
    - **Flood-Resilient Infrastructure:** Elevated buildings and flood barriers to protect against flooding, alongside a robust drainage system.
    - **Energy Efficiency and Cooling:** Use of passive building design (e.g., natural ventilation, thermal mass) to combat heat stress and reduce energy demand.
    - **Storm-Resistant Structures:** Incorporating reinforced concrete and wind-resistant materials to withstand high winds and storms.
    - **Water Efficiency:** Incorporating rainwater collection and recycling systems for irrigation and non-potable use.
2. **Plans to Adapt to Future Climate-Related Risks:**
    - **Ongoing Risk Assessments:** Regular climate risk assessments and adaptive measures based on new climate data and projections.

- **Flexible Design:** Ensuring the infrastructure is adaptable to future climate conditions, such as increased rainfall or rising temperatures, through scalable systems (e.g., additional green spaces or increased drainage capacity).

3. **Monitoring and Evaluation to Ensure Climate Resilience and Adaptation:**
    - **Climate Monitoring:** Setting up a monitoring system for weather patterns, water availability, and energy consumption to assess the effectiveness of resilience measures.
    - **Post-Construction Audits:** Conducting regular audits to evaluate the climate resilience of the development and adapt as needed.
    - **Stakeholder Feedback:** Continuous engagement with residents and local authorities to gather feedback on climate adaptation measures and make improvements where necessary.

Section 5: Stakeholder Engagement

1. **Stakeholder Engagement in the Development Process:**
    - **Public Consultations:** Engaging with local communities, including potential residents and local leaders, to ensure their concerns and suggestions are considered in the planning process.
    - **Partnerships:** Collaboration with climate experts, engineers, and environmentalists to integrate climate resilience strategies into the design and construction phases.
2. **Communication of Climate-Related Risks and Opportunities to Stakeholders:**
    - **Workshops and Public Forums:** Organizing workshops to raise awareness about climate risks and how the project will address them through resilient design and adaptation strategies.
    - **Regular Updates:** Providing updates to stakeholders on the progress of climate resilience initiatives, such as renewable energy adoption or flood management systems.

3. **Plans to Engage Stakeholders in the Project's Climate Resilience and Adaptation Efforts:**
    - **Climate Resilience Task Force:** Establishing a dedicated team to monitor and implement climate resilience measures and involving community representatives in this process.

Section 6: Additional Information

1. **Other Climate-Related Risks or Opportunities:**
    - **Climate-Responsive Landscaping:** Including native plants and climate-adapted species to reduce water usage and enhance biodiversity.
    - **Heat Stress Mitigation:** Incorporating reflective surfaces, shading, and urban forestry to reduce heat islands.
2. **Additional Comments/Suggestions:**
    - **Sustainability Certification:** Seeking green building certifications to enhance the project's environmental credibility and attract investors.
    - **Incentives for Green Living:** Providing incentives for residents to adopt sustainable practices, such as offering rebates for solar panel installation or water-saving appliances.

Climate Risk Assessment for Cashew Plantation Concession and Development Project (PPP)

Section 1: Project Information

1. **Project Name:** Cashew Plantation Concession and Development Project
2. **Location:** Eruwa, Oyo State, Nigeria
3. **Sector/Category:** Agriculture (Plantation and Agro-Processing)
4. **Estimated Cost:** ₦75,000,000.00.
5. **Expected Duration:** The project is expected to span over a period of 5 to 10 years, considering the growth cycle of cashew trees (approximately 3 to 5 years for initial yields) and the long-term development goals.

Section 2: Climate-Related Risks

1. **Climate-Related Risks Identified:**
    - **Drought:** The cashew plantation could face water scarcity due to shifting rainfall patterns and prolonged dry seasons.
    - **Flooding:** Heavy rainfall during the wet season may lead to flooding, particularly in low-lying areas of the plantation.
    - **Heat Stress:** Increased temperatures, especially in the dry season, could affect plant health and productivity.
    - **Pests and Diseases:** Warmer temperatures and humidity changes may alter the dynamics of pests and diseases, impacting crop yields.
    - **Soil Erosion:** Erosion caused by heavy rains could degrade soil quality and affect the long-term productivity of the plantation.
2. **Likelihood of Climate-Related Risks Occurring:**
    - **Drought:** Likely, due to the increasing unpredictability of rainfall patterns in the region.
    - **Flooding:** Possible, particularly if there is poor land management and insufficient drainage systems.
    - **Heat Stress:** Likely, given rising average temperatures in the region.

- **Pests and Diseases:** Likely, as changing climate conditions can alter the behaviour and distribution of pests.
- **Soil Erosion:** Moderate, depending on the implementation of soil conservation practices.

3. **Potential Impacts of These Climate-Related Risks on the Project:**
    - **Drought:** Reduced water availability for irrigation, which may harm the cashew trees and reduce yields.
    - **Flooding:** Damage to young trees, soil erosion, and potential loss of yield due to waterlogging and root damage.
    - **Heat Stress:** Decreased growth rates, premature shedding of fruit, and reduced cashew quality.
    - **Pests and Diseases:** Increased pest pressure leading to a reduction in yield and quality, requiring additional pest management measures.
    - **Soil Erosion:** Degradation of soil, affecting the plantation's ability to support healthy trees and decreasing long-term productivity.
4. **Existing Measures to Mitigate Climate-Related Risks:**
    - **Drought:** Implementing efficient irrigation systems (e.g., drip irrigation) to ensure adequate water supply during dry spells.
    - **Flooding:** Creating proper drainage systems to manage excess water and prevent waterlogging in the plantation.
    - **Heat Stress:** Selection of drought-tolerant and heat-resistant cashew varieties, and providing shade for young trees during the hottest periods.
    - **Pests and Diseases:** Integrated pest management practices, including biological controls and climate monitoring for early pest detection.
    - **Soil Erosion:** Employing terracing, planting cover crops, and mulching to protect the soil from erosion and improve soil structure.

Section 3: Climate-Related Opportunities

1. **Climate-Related Opportunities Identified:**

- **Renewable Energy:** Using solar energy for irrigation pumps and other operations within the plantation.
- **Climate-Resilient Crops:** Utilizing cashew varieties that are more resilient to heat and drought.
- **Sustainable Agroforestry:** Integrating other tree species to enhance biodiversity, soil fertility, and water retention.
- **Carbon Sequestration:** Establishing a large cashew plantation can contribute to carbon capture and storage, providing environmental benefits and potential carbon credits.
- **Agro-Processing and Value-Added Products:** Leveraging the cashew nuts for processing and creating value-added products such as cashew butter or snacks, thereby adding value to the local economy.

2. **Likelihood of Climate-Related Opportunities Occurring:**
    - **Renewable Energy:** Likely, as solar energy technology becomes more affordable and its implementation in agricultural projects is increasingly feasible.
    - **Climate-Resilient Crops:** Likely, as research into climate-resilient crops and farming practices improves.
    - **Sustainable Agroforestry:** Likely, as agroforestry practices gain popularity and are recognized for their environmental and economic benefits.
    - **Carbon Sequestration:** Likely, given the global demand for carbon credits and the project's potential to support sustainable environmental practices.
    - **Agro-Processing and Value-Added Products:** Likely, with the development of a processing infrastructure and increasing market demand for cashew-based products.
3. **Potential Benefits of These Climate-Related Opportunities for the Project:**
    - **Renewable Energy:** Reduced operational costs through energy savings and improved sustainability.

- **Climate-Resilient Crops:** Increased resilience to climate extremes, ensuring consistent yields and product quality.
- **Sustainable Agroforestry:** Enhanced biodiversity, improved water retention, and increased long-term soil fertility.
- **Carbon Sequestration:** Potential revenue from carbon credits, enhancing the financial viability of the project and promoting environmental sustainability.
- **Agro-Processing and Value-Added Products:** Increased profitability from cashew-related products and the creation of local jobs in processing and manufacturing.

4. **Existing Measures to Take Advantage of These Climate-Related Opportunities:**
    - **Renewable Energy:** Plans to integrate solar-powered irrigation systems and renewable energy sources into the project.
    - **Climate-Resilient Crops:** Working with agricultural research institutions to select appropriate, climate-resilient cashew varieties.
    - **Sustainable Agroforestry:** Design the plantation layout to incorporate agroforestry practices and diversify crops, improving both environmental and economic sustainability.
    - **Carbon Sequestration:** Partnering with carbon certification bodies to quantify and certify carbon credits from the plantation.
    - **Agro-Processing and Value-Added Products:** Setting up processing units for cashew nuts, creating local employment and boosting the economic impact of the plantation.

Section 4: Climate Resilience and Adaptation

1. **Measures to Ensure Project Resilience to Climate-Related Risks:**
    - **Drought and Water Scarcity:** Implementation of rainwater harvesting systems and efficient irrigation techniques (drip irrigation).
    - **Flooding:** Construction of raised planting beds and well-designed drainage systems to manage excess water and prevent flooding.

- **Heat Stress:** Use of climate-resistant cashew varieties and agroforestry techniques to provide shade and shelter for young trees.
- **Pests and Diseases:** Regular monitoring, pest management strategies, and climate data integration for proactive responses.
- **Soil Erosion:** Establishment of soil conservation measures like contour farming and use of organic mulches.

2. **Plans to Adapt the Project to Future Climate-Related Risks:**
    - **Adapting Crop Varieties:** Continued research and selection of cashew varieties that are more resilient to changing climatic conditions, including drought and high temperatures.
    - **Building Climate-Resilient Infrastructure:** Investment in more robust and flexible infrastructure to support changing water and energy needs.
    - **Improved Land Management Practices:** Adoption of agroecological practices that promote long-term soil fertility and resilience to extreme weather.
3. **How the Project Will Be Monitored and Evaluated for Climate Resilience and Adaptation:**
    - **Monitoring Systems:** Use of climate data monitoring systems to track rainfall patterns, temperature fluctuations, and other relevant variables.
    - **Performance Audits:** Regular evaluations of crop yield, water use efficiency, and pest management to assess the effectiveness of resilience strategies.
    - **Stakeholder Feedback:** Engagement with local farmers, agronomists, and environmental experts to gather feedback on adaptive measures and adjust accordingly.

Section 5: Stakeholder Engagement

1. **Stakeholder Engagement in the Development Process:**
    - **Community Consultations:** Engaging with local communities in Eruwa to understand their concerns and needs, ensuring they are involved in the project's design and execution.

- **Partnerships with Local Farmers and Experts:** Collaboration with local farmers and agricultural experts to implement climate-smart agriculture techniques.

2. **Communication of Climate-Related Risks and Opportunities to Stakeholders:**
    - **Workshops and Awareness Programs:** Organizing workshops for local stakeholders to raise awareness of climate risks and the measures being taken to mitigate them.
    - **Regular Communication:** Providing regular updates on project progress and climate resilience initiatives to stakeholders.
3. **Plans to Engage Stakeholders in the Project's Climate Resilience and Adaptation Efforts:**
    - **Advisory Panels:** Creating advisory panels comprising local stakeholders, experts, and government representatives to guide climate resilience efforts.
    - **Training Programs:** Offering training to local farmers and workers on sustainable agricultural practices and climate adaptation strategies.

Section 6: Additional Information

1. **Other Climate-Related Risks or Opportunities:**
    - **Water Management and Efficiency:** Enhancing water use efficiency through the adoption of new irrigation technologies and ensuring sustainable water resources.
    - **Sustainable Certification:** Seeking sustainability certifications for the plantation to attract eco-conscious investors and markets.
2. **Additional Comments/Suggestions:**
    - **Long-Term Environmental Monitoring:** Establishing a long-term environmental monitoring plan to track soil health, water usage, and biodiversity over time.
    - **Integration with Local Development Plans:** Ensuring that the project is aligned with the broader environmental and agricultural development goals of Oyo State.

Climate Risk Assessment for Aviation Fuel Facility Development Project (PPP)

Section 1: Project Information

1. **Project Name:** Aviation Fuel Facility Development Project
2. **Location:** Ibadan, Oyo State, Nigeria
3. **Sector/Category:** Infrastructure (Aviation, Energy)
4. **Estimated Cost:** ₦1,207,678,540.38.
5. **Expected Duration:** Approximately 3 to 5 years for construction and commissioning, with operational phases continuing thereafter.

Section 2: Climate-Related Risks

1. **Climate-Related Risks Identified:**
    - **Flooding:** Due to heavy rainfall, especially during the rainy season, flooding could affect the facility's operational capacity, particularly if the site is near flood-prone areas or lacks adequate drainage systems.
    - **Drought:** Potential water scarcity during dry seasons could impact water-based operations, particularly if cooling systems or other water-intensive processes are required.
    - **Heat Stress:** Higher temperatures and heatwaves could impact both the structural integrity of the facility and the safe handling of aviation fuel, which requires strict temperature controls.
    - **Severe Weather Events:** Extreme weather conditions, such as storms and cyclones, could damage infrastructure and disrupt operations.
    - **Coastal Erosion (if near water bodies):** Potential for erosion of the facility's coastal infrastructure due to rising sea levels and changing weather patterns.
2. **Likelihood of Climate-Related Risks Occurring:**
    - **Flooding:** Likely, particularly during the wet season, if local drainage systems are not adequately designed.
    - **Drought:** Possible, although less frequent in this region, but could become a concern as climate variability increases.

- **Heat Stress:** Likely, due to rising temperatures in the region and the nature of the project.
- **Severe Weather Events:** Possible, with an increasing likelihood of unpredictable weather events as a result of climate change.
- **Coastal Erosion:** Unlikely if the facility is not near the coast but needs assessment if close to a river or body of water.

3. **Potential Impacts of These Climate-Related Risks on the Project:**
   - **Flooding:** Damage to infrastructure, delayed construction schedules, disruption of supply chains, and safety hazards for workers and operations.
   - **Drought:** Disruption of water supply systems, affecting cooling processes or sanitation needs, potentially delaying operations or increasing operational costs.
   - **Heat Stress:** Compromised structural materials, increased operational costs to maintain temperature control, and health risks for workers.
   - **Severe Weather Events:** Damaged or destroyed infrastructure, which would incur high repair and recovery costs, and operational downtime.
   - **Coastal Erosion:** Loss of critical infrastructure, affecting facility stability and safety.
4. **Existing Measures to Mitigate Climate-Related Risks:**
   - **Flooding:** Proper site selection away from flood-prone areas and implementation of flood barriers, drainage systems, and flood-resistant building designs.
   - **Drought:** Development of water-efficient systems and exploration of alternative water sources, including rainwater harvesting and water recycling.
   - **Heat Stress:** Installation of cooling systems, temperature monitoring, and selection of durable, heat-resistant building materials for the facility.

- **Severe Weather Events:** Use of reinforced construction materials, flood-proof infrastructure, and an emergency response plan to prepare for extreme weather.
- **Coastal Erosion:** If applicable, the construction of barriers or levees to prevent erosion and safeguard the integrity of the facility.

Section 3: Climate-Related Opportunities

1. **Climate-Related Opportunities Identified:**
    - **Renewable Energy:** Integration of solar or wind energy for the facility's power supply, reducing carbon emissions and operational costs.
    - **Energy Efficiency:** Adoption of energy-efficient technologies, reducing the facility's carbon footprint and improving long-term sustainability.
    - **Climate-Resilient Infrastructure:** Designing the facility with advanced climate-resilient materials and technologies that can withstand extreme weather events and temperature variations.
    - **Green Certification:** Seeking environmental certification (such as LEED or ISO 14001) for the facility, which could attract environmentally-conscious investors and customers.
    - **Local Employment and Training:** Leveraging the development of the project to provide training and job opportunities in green construction practices and renewable energy integration.
2. **Likelihood of Climate-Related Opportunities Occurring:**
    - **Renewable Energy:** Likely, as renewable energy technologies become more cost-competitive and widely adopted in infrastructure projects.
    - **Energy Efficiency:** Likely, as energy efficiency is increasingly prioritized in modern infrastructure and energy standards.
    - **Climate-Resilient Infrastructure:** Likely, especially given growing recognition of the need for robust and climate-resilient buildings and facilities.

- **Green Certification:** Possible, depending on the design and operational practices adopted by the project.
- **Local Employment and Training:** Likely, as the project would generate employment and require specialized skills in renewable energy and sustainable practices.

3. **Potential Benefits of These Climate-Related Opportunities for the Project:**
   - **Renewable Energy:** Reduced energy costs, increased operational sustainability, and lower carbon emissions, contributing to the project's long-term environmental goals.
   - **Energy Efficiency:** Lower energy consumption, reduced costs, and improved environmental performance.
   - **Climate-Resilient Infrastructure:** Long-term cost savings from reduced maintenance and repair due to weather-related damage, and improved operational stability.
   - **Green Certification:** Enhanced reputation and attractiveness to investors, customers, and stakeholders, and potential access to green funding.
   - **Local Employment and Training:** Economic growth for the local community, fostering a skilled workforce and boosting the local economy.
4. **Existing Measures to Take Advantage of These Climate-Related Opportunities:**
   - **Renewable Energy:** Exploration of solar panels or wind turbines for energy generation at the facility.
   - **Energy Efficiency:** Use of energy-efficient equipment and systems, including LED lighting, advanced HVAC systems, and smart energy management systems.
   - **Climate-Resilient Infrastructure:** Collaborating with architects and engineers specializing in climate resilience to ensure the facility meets all modern resilience standards.

- **Green Certification:** Engaging with certification bodies early in the design phase to ensure the facility meets all necessary criteria for green certifications.
- **Local Employment and Training:** Partnering with local technical training centers to ensure the community is prepared for jobs in construction, renewable energy, and facility maintenance.

Section 4: Climate Resilience and Adaptation

1. **Measures to Ensure Project Resilience to Climate-Related Risks:**
    - **Flooding:** Incorporation of flood management systems, including drainage, water diversion, and flood-resistant designs.
    - **Drought:** Efficient water use systems, including closed-loop systems and water recycling, as well as backup water storage to mitigate drought effects.
    - **Heat Stress:** Installation of climate-control systems and selection of materials capable of withstanding higher temperatures.
    - **Severe Weather Events:** Building infrastructure to withstand high winds, heavy rains, and potential extreme weather events, with robust disaster preparedness protocols in place.
    - **Coastal Erosion:** If near water bodies, construction of protective barriers and reinforcement of shoreline structures.
2. **Plans to Adapt the Project to Future Climate-Related Risks:**
    - **Climate Forecasting:** Ongoing monitoring of climate trends and adaptation of project plans in response to changes in weather patterns.
    - **Infrastructure Flexibility:** Designing the facility with flexible infrastructure that can adapt to future environmental conditions (e.g., future flooding, temperature extremes).
    - **Water Source Diversification:** Exploring alternative water sources and technologies (e.g., desalination, rainwater harvesting) to address potential water shortages.
3. **How the Project Will Be Monitored and Evaluated for Climate Resilience and Adaptation:**

- **Environmental Monitoring:** Regular environmental assessments to track climate-related conditions such as temperature, rainfall, and water availability.
- **Performance Reviews:** Periodic evaluations of the facility's climate resilience, including risk assessments and necessary adaptations.
- **Stakeholder Feedback:** Engaging local communities, government bodies, and experts to assess ongoing climate risks and adjust the project's adaptation strategies accordingly.

Section 5: Stakeholder Engagement

1. **Stakeholder Engagement in the Development Process:**
    - **Public Consultations:** Ongoing dialogue with local communities, environmental NGOs, and government agencies to ensure alignment with community interests and climate goals.
    - **Expert Consultations:** Engaging climate and infrastructure experts to integrate best practices in climate resilience and adaptation into the project's planning and design stages.
2. **Communication of Climate-Related Risks and Opportunities to Stakeholders:**
    - **Workshops and Briefings:** Holding workshops to inform stakeholders about the identified climate risks, opportunities, and planned resilience measures.
    - **Regular Reporting:** Providing stakeholders with regular updates on the project's progress and climate resilience strategies.
3. **Plans to Engage Stakeholders in the Project's Climate Resilience and Adaptation Efforts:**
    - **Community Involvement:** Providing opportunities for the local community to participate in sustainability and resilience initiatives through education and skill-building programs.
    - **Collaborations with Local Experts:** Partnering with local environmental experts and universities to refine climate resilience strategies.

Section 6: Additional Information

1. **Other Climate-Related Risks or Opportunities:**
    - **Climate Policy Changes:** Future regulatory requirements related to emissions reductions, renewable energy, and sustainability that may impact project design and operations.
2. **Additional Comments/Suggestions:**
    - **Holistic Climate Strategy:** Developing a long-term climate strategy that includes not only infrastructure but also workforce development, community resilience, and energy transitions.
    - **Future-Proofing:** Ensuring that the facility is adaptable to future climate conditions, including potential technological advancements in climate adaptation and energy efficiency.

Climate Risk Assessment for Inland Dry Port Project (PPP)

Section 1: Project Information

1. **Project Name:** Inland Dry Port Project
2. **Location:** Erunmu, Ibadan, Oyo State, Nigeria
3. **Sector/Category:** Infrastructure (Transport, Logistics, and Trade)
4. **Estimated Cost:** ₦43,200,000,000.00.
5. **Expected Duration:** The project is expected to be completed in 3 to 5 years, depending on the scale of construction and financing.

Section 2: Climate-Related Risks

1. **Climate-Related Risks Identified:**
    - **Flooding:** The Erunmu area may experience flooding, particularly during the rainy season. Poor drainage systems or heavy rainfall could cause significant disruptions to operations and infrastructure.
    - **Drought:** Drought conditions may affect water availability for construction processes, and the demand for water in logistics operations could rise during dry periods.
    - **Heat Stress:** The increasing temperatures could impact the durability of infrastructure, particularly roads, and the working conditions for construction workers and long-term staff.
    - **Severe Weather Events:** Extreme weather events like storms or wind damage may impact the infrastructure and disrupt logistics operations, especially during the wet season.
    - **Soil Erosion:** The project location could be susceptible to erosion, particularly near water bodies, which could affect the stability of the infrastructure and surrounding areas.
2. **Likelihood of Climate-Related Risks Occurring:**
    - **Flooding:** Likely, especially in low-lying areas with inadequate drainage or during periods of high rainfall.
    - **Drought:** Possible, but not frequent, although there is potential for water scarcity as climate change alters rainfall patterns.

- **Heat Stress:** Likely, given the increasing temperatures and potential urban heat island effects in the Ibadan region.
- **Severe Weather Events:** Possible, given global climate trends that increase the frequency and intensity of storms, wind, and flooding.
- **Soil Erosion:** Likely in some areas, particularly near water sources or where land clearing is required.

3. **Potential Impacts of These Climate-Related Risks on the Project:**
    - **Flooding:** Damage to roads, warehouses, and other infrastructure, delay in construction schedules, operational disruptions, and increased maintenance costs.
    - **Drought:** Limited water availability for construction or operations, increased costs for water sourcing, and potential delays due to water scarcity.
    - **Heat Stress:** Degradation of materials, increased operational costs for cooling and maintenance, and health risks for workers.
    - **Severe Weather Events:** Physical damage to infrastructure, delays in construction, and logistical disruptions.
    - **Soil Erosion:** Instability of foundations, damage to roads, and the risk of environmental degradation in surrounding areas.
4. **Existing Measures to Mitigate These Climate-Related Risks:**
    - **Flooding:** Flood-proofing infrastructure, improving local drainage systems, and siting the facility in areas with lower flood risk.
    - **Drought:** Use of water-efficient technologies, recycling water, and sourcing alternative water supplies (e.g., rainwater harvesting, boreholes).
    - **Heat Stress:** Selection of heat-resistant materials for roads and facilities, use of shade structures, and incorporating green spaces that provide cooling benefits.
    - **Severe Weather Events:** Strengthening building structures, reinforcing roofs, and establishing stormwater management systems.

- **Soil Erosion:** Installing erosion control measures, such as retaining walls and landscaping techniques, and using sustainable land management practices.

Section 3: Climate-Related Opportunities

1. **Climate-Related Opportunities Identified:**
    - **Renewable Energy:** Potential to integrate solar or wind energy to power operations, which would reduce carbon emissions and dependency on non-renewable energy sources.
    - **Energy-Efficient Infrastructure:** Implementing energy-efficient lighting, smart energy management systems, and low-energy vehicles for logistics and transport.
    - **Climate-Resilient Infrastructure:** Building climate-resilient structures using materials and designs that can withstand heat, floods, and other extreme weather events.
    - **Sustainable Water Management:** Incorporating rainwater harvesting, wastewater recycling, and water-efficient technologies to reduce water consumption.
    - **Green Transport Options:** Promoting the use of electric or low-carbon-emission vehicles for transporting goods in and out of the port.
2. **Likelihood of Climate-Related Opportunities Occurring:**
    - **Renewable Energy:** Likely, as solar and wind energy are increasingly viable and cost-effective options for large infrastructure projects in Nigeria.
    - **Energy-Efficient Infrastructure:** Likely, as energy efficiency standards and practices are becoming common in modern infrastructure projects.
    - **Climate-Resilient Infrastructure:** Likely, as climate resilience is becoming an integral part of sustainable construction.
    - **Sustainable Water Management:** Possible, as more efficient water systems are integrated into new development projects to reduce reliance on local water sources.

- **Green Transport Options:** Possible, especially if the facility integrates electric or hybrid vehicles as part of the long-term operational plan.

3. **Potential Benefits of These Climate-Related Opportunities for the Project:**
    - **Renewable Energy:** Reduced operational costs, lower environmental impact, and positive public perception, which could attract green investors.
    - **Energy-Efficient Infrastructure:** Reduced energy consumption, lower costs, and a sustainable operational model.
    - **Climate-Resilient Infrastructure:** Enhanced durability of the facility, reduced maintenance costs, and lower risk of damage from extreme weather events.
    - **Sustainable Water Management:** Improved resource efficiency and reduced dependence on local water supplies, leading to cost savings.
    - **Green Transport Options:** Reduced carbon emissions and compliance with environmental regulations, leading to lower operational costs and improved sustainability.
4. **Existing Measures to Take Advantage of These Climate-Related Opportunities:**
    - **Renewable Energy:** Incorporating solar panels or small wind turbines to power lighting and certain operational functions at the dry port.
    - **Energy-Efficient Infrastructure:** Integrating LED lighting, motion sensors, and energy-efficient HVAC systems.
    - **Climate-Resilient Infrastructure:** Collaborating with climate adaptation specialists and engineers to ensure the use of resilient materials and designs.
    - **Sustainable Water Management:** Setting up water recycling systems, efficient irrigation for landscaping, and rainwater collection systems.
    - **Green Transport Options:** Introducing electric vehicles or hybrid transport systems for on-site logistics and transportation.

Section 4: Climate Resilience and Adaptation

1. **Measures to Ensure Project Resilience to Climate-Related Risks:**
    - **Flooding:** Elevation of key infrastructure, installation of drainage systems, and use of flood barriers to prevent damage.
    - **Drought:** Installation of water-efficient systems, rainwater harvesting, and water storage solutions to reduce dependence on local water supplies.
    - **Heat Stress:** Building with heat-resistant materials, installing shading, and incorporating cooling technologies for both workers and infrastructure.
    - **Severe Weather Events:** Reinforcing structures with wind-resistant materials, elevating buildings to prevent flooding, and preparing emergency response plans.
    - **Soil Erosion:** Using natural landscaping and erosion control techniques, including terracing and ground cover plants.
2. **Plans to Adapt the Project to Future Climate-Related Risks:**
    - **Climate Forecasting:** Regular updates to climate risk assessments based on new climate models and forecasting data.
    - **Infrastructure Flexibility:** Designing modular and adaptable infrastructure that can evolve in response to changing climate patterns.
    - **Water Management:** Expanding water storage and developing local water alternatives, such as deep wells or desalination plants, as drought conditions become more severe.
3. **How the Project Will Be Monitored and Evaluated for Climate Resilience and Adaptation:**
    - **Monitoring Systems:** Installing environmental sensors to track temperature, rainfall, and soil erosion, and to provide real-time data to adjust operations.
    - **Performance Reviews:** Regular reviews of climate resilience measures and their effectiveness, including building audits and operational performance evaluations.

- **Stakeholder Engagement:** Engaging with local and international experts in climate resilience to review the project's ongoing adaptation measures.

Section 5: Stakeholder Engagement

1. **Stakeholder Engagement in the Development Process:**
    - **Community Consultations:** Engaging local communities early in the design process to understand potential climate-related risks and to incorporate local knowledge and needs.
    - **Expert Collaboration:** Consulting with climate resilience experts to ensure that the project incorporates the latest adaptation strategies.
2. **Communication of Climate-Related Risks and Opportunities to Stakeholders:**
    - **Workshops and Presentations:** Conducting workshops with stakeholders to discuss the identified climate risks, opportunities, and resilience strategies.
    - **Regular Updates:** Keeping stakeholders informed through regular briefings and progress reports.
3. **Plans to Engage Stakeholders in the Project's Climate Resilience and Adaptation Efforts:**
    - **Local Partnerships:** Forming partnerships with local environmental organizations and research institutions to continue evaluating and adapting the project's climate resilience measures.
    - **Ongoing Education and Awareness:** Providing training to local communities, contractors, and workers on climate resilience and sustainable construction practices.

Section 6: Additional Information

1. **Other Climate-Related Risks or Opportunities:**
    - **Climate-Induced Migration:** Climate change could lead to migration patterns that affect the labor force availability. This could present challenges in terms of project planning and workforce management.

2. **Additional Comments/Suggestions:**
    - **Integrated Climate Strategy:** Develop a long-term climate strategy that includes reducing emissions, ensuring climate resilience, and improving community adaptation to climate risks.
    - **Ongoing Resilience Assessment:** Regularly assess emerging climate risks and adjust the project's design, operations, and infrastructure accordingly to ensure it remains resilient over time.

Climate Risk Assessment for Business Complex Redevelopment Project (PPP)

Section 1: Project Information

1. **Project Name:** Business Complex Redevelopment Project
2. **Location:** Samonda, Ibadan, Oyo State, Nigeria
3. **Sector/Category:** Infrastructure (Commercial Real Estate, Urban Development)
4. **Estimated Cost:** ₦10,000,000,000.00.
5. **Expected Duration:** 2 to 3 years, with timelines depending on the complexity of the redevelopment and coordination with public and private partners.

Section 2: Climate-Related Risks

1. **Climate-Related Risks Identified:**
    - **Flooding:** Samonda, like many parts of Ibadan, is prone to flooding during heavy rains, particularly in areas with inadequate drainage infrastructure.
    - **Heat Stress:** Increased temperatures due to climate change can lead to heat stress in the area, affecting the comfort of the workers and tenants and putting a strain on cooling infrastructure.
    - **Drought:** Prolonged droughts may affect the water supply, impacting construction activities, as well as water needs for the facilities once operational.
    - **Urban Heat Island Effect:** Samonda's urbanization could contribute to the urban heat island effect, increasing temperatures in the area and potentially affecting the project's long-term sustainability.
    - **Soil Erosion:** Areas with steep terrain or insufficient vegetation may experience soil erosion, particularly in the surrounding areas of the complex.
2. **Likelihood of Climate-Related Risks Occurring:**
    - **Flooding:** Likely, especially in the rainy season, as the area is prone to surface runoff and inadequate drainage systems.

- **Heat Stress:** Likely, with the growing urban population and increasing global temperatures.
- **Drought:** Possible, although not frequent, droughts are becoming more common in many parts of Nigeria, including Ibadan.
- **Urban Heat Island Effect:** Likely, as the city continues to grow and urbanize.
- **Soil Erosion:** Possible, particularly in areas where land is cleared for the development of the complex, especially if proper erosion control measures are not put in place.

3. **Potential Impacts of These Climate-Related Risks on the Project:**
    - **Flooding:** Damage to infrastructure, construction delays, increased maintenance costs, and operational disruptions if not properly mitigated.
    - **Heat Stress:** Increased energy consumption for cooling systems, higher operational costs, and discomfort for workers and tenants.
    - **Drought:** Water shortages that could affect the construction process, operational activities, and the quality of facilities.
    - **Urban Heat Island Effect:** Increased operational costs for cooling, reduced comfort for workers, and potential damage to sensitive equipment and materials.
    - **Soil Erosion:** Damage to construction sites, instability of building foundations, and degradation of the surrounding environment.
4. **Existing Measures to Mitigate These Climate-Related Risks:**
    - **Flooding:** Incorporating stormwater management systems, elevating key infrastructure, improving local drainage networks, and using flood barriers where necessary.
    - **Heat Stress:** Selecting energy-efficient materials, using passive cooling strategies, and including green spaces that reduce heat in urban areas.

- **Drought:** Using water-efficient technologies, recycling water, and establishing alternative water sources (e.g., rainwater harvesting, boreholes).
- **Urban Heat Island Effect:** Integrating green roofs, trees, and other vegetation in the design to mitigate heat accumulation.
- **Soil Erosion:** Implementing proper drainage systems, planting vegetation around the site, and using erosion control techniques such as terracing and ground cover.

Section 3: Climate-Related Opportunities

1. **Climate-Related Opportunities Identified:**
   - **Renewable Energy:** Integration of solar panels and wind energy systems to power the complex, reducing reliance on non-renewable energy sources and enhancing sustainability.
   - **Energy-Efficient Infrastructure:** Adoption of energy-efficient technologies, such as LED lighting, passive cooling systems, and smart building management systems.
   - **Climate-Resilient Infrastructure:** Building structures that are durable and adaptable to future climate risks, such as incorporating flood-resistant materials and resilient design principles.
   - **Green Spaces:** Creating parks, gardens, and other green spaces within the complex to absorb carbon, reduce heat, and promote a healthier environment for tenants and workers.
2. **Likelihood of Climate-Related Opportunities Occurring:**
   - **Renewable Energy:** Likely, as renewable energy systems like solar are becoming increasingly viable and cost-effective.
   - **Energy-Efficient Infrastructure:** Likely, given the growing emphasis on sustainable construction practices in Nigeria and globally.
   - **Climate-Resilient Infrastructure:** Likely, as more projects are focusing on long-term sustainability and climate adaptation.
   - **Green Spaces:** Possible, depending on design choices and space availability within the urban redevelopment area.

3. **Potential Benefits of These Climate-Related Opportunities for the Project:**
    - **Renewable Energy:** Reduced energy costs, lower carbon emissions, and a positive reputation as a sustainable development project, attracting eco-conscious investors.
    - **Energy-Efficient Infrastructure:** Lower operational costs, enhanced sustainability, and a more attractive environment for tenants.
    - **Climate-Resilient Infrastructure:** Increased longevity of the complex, reduced maintenance costs, and less risk of damage from climate-related events.
    - **Green Spaces:** Improved air quality, enhanced aesthetic appeal, increased property value, and positive impact on tenant well-being.
4. **Existing Measures to Take Advantage of These Climate-Related Opportunities:**
    - **Renewable Energy:** Installing solar panels on rooftops and using wind energy where feasible.
    - **Energy-Efficient Infrastructure:** Incorporating energy-efficient lighting and HVAC systems into the design, as well as optimizing building orientation for natural cooling.
    - **Climate-Resilient Infrastructure:** Working with environmental consultants to ensure that the design considers future climate conditions and adopts resilient construction methods.
    - **Green Spaces:** Designing the complex with an emphasis on green infrastructure and sustainable landscaping.

Section 4: Climate Resilience and Adaptation

1. **Measures to Ensure the Project Is Resilient to Climate-Related Risks:**
    - **Flooding:** Designing the complex with elevated buildings, flood barriers, and efficient stormwater management systems.
    - **Heat Stress:** Incorporating passive design strategies, such as building orientation to minimize sun exposure, and installing green roofs and cooling systems.

- **Drought:** Installing water-efficient fixtures, rainwater harvesting systems, and using sustainable landscaping practices.
- **Urban Heat Island Effect:** Increasing the amount of greenery in and around the site, including trees, green roofs, and permeable surfaces.
- **Soil Erosion:** Planting vegetation to stabilize the soil, incorporating erosion control measures in the design, and ensuring proper grading and drainage.

2. **Plans to Adapt the Project to Future Climate-Related Risks:**
    - **Climate-Proofing:** Continual monitoring of climate patterns and incorporating adaptive measures into the infrastructure as new risks emerge.
    - **Flexible Design:** Adopting modular construction practices and designing spaces that can be adapted for different uses as climate risks evolve.
3. **How the Project Will Be Monitored and Evaluated for Climate Resilience and Adaptation:**
    - **Monitoring Systems:** Setting up sensors to monitor environmental conditions like temperature, rainfall, and soil moisture to detect any early signs of climate-related stress.
    - **Performance Audits:** Regular reviews of energy consumption, water use, and environmental impacts to ensure the project is meeting sustainability goals.
    - **Stakeholder Feedback:** Engaging with tenants, local communities, and climate experts to assess how well the project is adapting to changing climate conditions.

Section 5: Stakeholder Engagement

1. **Stakeholder Engagement in the Development Process:**
    - **Community Engagement:** Involving local stakeholders early on to assess their concerns about climate-related risks, ensuring that the project addresses their needs and aspirations.

- **Expert Consultation:** Engaging with environmental consultants and climate resilience experts to incorporate the latest knowledge and practices.

2. **Communication of Climate-Related Risks and Opportunities to Stakeholders:**
    - **Workshops and Information Sessions:** Holding regular workshops and information sessions with stakeholders to discuss climate-related risks, opportunities, and mitigation strategies.
    - **Sustainability Reporting:** Providing stakeholders with updates on the project's progress in achieving climate resilience goals and how it addresses climate-related risks.
3. **Plans to Engage Stakeholders in the Project's Climate Resilience and Adaptation Efforts:**
    - **Collaboration with Local Communities:** Working with local governments and community leaders to ensure the adaptation measures are well understood and supported.
    - **Continuous Feedback Loop:** Ensuring that stakeholders are actively involved throughout the project's lifecycle and that their feedback informs ongoing climate resilience efforts.

Section 6: Additional Information

1. **Other Climate-Related Risks or Opportunities:**
    - **Health Impacts:** Climate risks such as heat stress and flooding can affect public health. The project can include climate-sensitive health measures, such as cooling centers and emergency preparedness for extreme weather.
2. **Additional Comments/Suggestions:**
    - **Sustainability Certification:** The project could pursue certifications like LEED (Leadership in Energy and Environmental Design) to formally recognize its commitment to sustainable and climate-resilient development.

- **Long-Term Climate Strategy:** The development of a long-term strategy that continually assesses emerging climate risks and ensures that the project adapts over time to changing environmental conditions.

Climate Risk Assessment for the Upgrade and Construction of Radiotherapy Treatment Center Project at Adeoyo State Hospital (PPP)

Section 1: Project Information

1. **Project Name:** Upgrade and Construction of Radiotherapy Treatment Center
2. **Location:** Adeoyo State Hospital, Ibadan, Oyo State, Nigeria
3. **Sector/Category:** Healthcare Infrastructure (Medical Facilities)
4. **Estimated Cost:** The estimated cost is still under final review, but it will include expenditures for upgrading existing infrastructure, constructing new buildings for the radiotherapy treatment center, and acquiring necessary equipment. A detailed feasibility study will determine the exact cost.
5. **Expected Duration:** The project is expected to be completed in approximately 2-3 years, considering the complexity of the construction and installation of medical technology.

Section 2: Climate-Related Risks

1. **Climate-Related Risks Identified:**
    - **Flooding:** The location in Ibadan is vulnerable to flooding, particularly during the rainy season, due to inadequate drainage infrastructure.
    - **Heat Stress:** Given global temperature rises, extreme heat could affect the comfort and efficiency of hospital staff and patients.
    - **Drought:** Water shortages, especially during dry periods, could affect both the construction process and hospital operations (e.g., water supply for treatments and cooling systems).
    - **Energy Shortages:** Prolonged droughts or disruptions in energy supply could hinder the hospital's ability to provide essential services, especially for critical treatments like radiotherapy.
    - **Urban Heat Island Effect:** As the urban area of Ibadan grows, increased surface temperatures may put extra demand on energy use for cooling and air conditioning in the hospital.
2. **Likelihood of Climate-Related Risks Occurring:**

- **Flooding:** Likely, especially during the rainy season, as heavy rains can overwhelm drainage systems in urban areas like Ibadan.
- **Heat Stress:** Likely, due to increasing global temperatures and the hot tropical climate of Ibadan.
- **Drought:** Possible but not frequent; however, prolonged dry spells have become more common in recent years.
- **Energy Shortages:** Possible, particularly if energy demand exceeds supply or if infrastructure challenges persist.
- **Urban Heat Island Effect:** Likely, with increasing urbanization, especially in densely populated areas like Ibadan.

3. **Potential Impacts of These Climate-Related Risks on the Project:**
   - **Flooding:** Disruption of construction work, potential damage to buildings, delays in project timelines, and the risk of damage to sensitive medical equipment.
   - **Heat Stress:** Increased cooling demands, higher operational costs, and reduced comfort for hospital staff and patients.
   - **Drought:** Water shortages could affect the daily operations of the hospital, hinder construction work, and increase operational costs.
   - **Energy Shortages:** Reduced power supply could interfere with medical procedures, particularly for essential treatments like radiotherapy that rely on stable power sources.
   - **Urban Heat Island Effect:** Increased energy demand for cooling systems, higher operational costs, and potential discomfort for both staff and patients.
4. **Existing Measures to Mitigate These Climate-Related Risks:**
   - **Flooding:** Integration of flood defenses such as elevated foundations, flood barriers, and a proper drainage system to manage stormwater runoff.
   - **Heat Stress:** Incorporating energy-efficient air conditioning systems, passive cooling design (e.g., shading, building orientation), and green spaces that reduce heat.

- **Drought:** Installing water-saving technologies like low-flow plumbing, rainwater harvesting systems, and implementing water recycling measures.
- **Energy Shortages:** Installation of backup power systems such as generators and exploring renewable energy options, including solar power to reduce dependence on the grid.
- **Urban Heat Island Effect:** Design considerations for green roofs, tree planting, and reflective materials to reduce heat absorption and improve thermal comfort.

Section 3: Climate-Related Opportunities

1. **Climate-Related Opportunities Identified:**
   - **Renewable Energy:** Incorporating solar energy to power certain aspects of the hospital, such as lighting and heating water, reducing reliance on grid power.
   - **Climate-Resilient Infrastructure:** Utilizing sustainable materials and construction techniques to build an infrastructure that can withstand future climate risks.
   - **Energy-Efficient Technologies:** Use of energy-efficient lighting, HVAC systems, and medical equipment to reduce operational energy demand.
   - **Water Conservation:** Implementing water-efficient practices and technologies, such as rainwater harvesting, to reduce the strain on local water resources.
2. **Likelihood of These Climate-Related Opportunities Occurring:**
   - **Renewable Energy:** Likely, as renewable energy options like solar have become more accessible and cost-effective.
   - **Climate-Resilient Infrastructure:** Likely, given increasing awareness of climate resilience in construction practices.
   - **Energy-Efficient Technologies:** Likely, due to the growing focus on energy savings and reducing the environmental footprint in healthcare projects.

- **Water Conservation:** Possible, especially as water scarcity becomes a more pressing issue.

3. **Potential Benefits of These Climate-Related Opportunities for the Project:**
    - **Renewable Energy:** Reduced energy costs and a positive environmental impact, enhancing the hospital's sustainability profile.
    - **Climate-Resilient Infrastructure:** Increased longevity of the infrastructure, reduced future repair costs, and better performance during extreme weather events.
    - **Energy-Efficient Technologies:** Reduced operational costs, greater energy independence, and improved hospital sustainability.
    - **Water Conservation:** Reduced water costs and the ability to better manage water resources, especially during drought conditions.
4. **Existing Measures to Take Advantage of These Climate-Related Opportunities:**
    - **Renewable Energy:** Exploring solar panel installations and energy storage solutions to reduce reliance on the power grid.
    - **Climate-Resilient Infrastructure:** Partnering with environmental consultants to ensure that design and materials meet the highest standards for climate resilience.
    - **Energy-Efficient Technologies:** Incorporating LED lighting, high-efficiency HVAC systems, and energy-efficient medical equipment into the design and procurement processes.
    - **Water Conservation:** Implementing rainwater harvesting and graywater recycling systems.

Section 4: Climate Resilience and Adaptation

1. **Measures to Ensure the Project Is Resilient to Climate-Related Risks:**
    - **Flooding:** Elevating critical structures, implementing flood-resistant design, and enhancing the local drainage systems to prevent waterlogging.

- **Heat Stress:** Installing climate-responsive materials, improving natural ventilation, and integrating passive cooling design principles.
- **Drought:** Ensuring efficient water usage through low-flow fixtures, rainwater harvesting, and establishing contingency plans for water shortages.
- **Energy Shortages:** Installing backup generators and exploring renewable energy sources like solar and wind to supplement the power supply.
- **Urban Heat Island Effect:** Increasing green spaces within and around the hospital, such as rooftop gardens, trees, and reflective surfaces to reduce heat absorption.

2. **Plans to Adapt the Project to Future Climate-Related Risks:**
    - **Adaptive Design:** Flexible infrastructure and planning for future upgrades to accommodate changing climate conditions, including future-proofing power and water supply systems.
    - **Climate Monitoring:** Continuous monitoring of climate patterns and adjusting operational strategies, such as energy usage, based on emerging data on climate impacts.
3. **How the Project Will Be Monitored and Evaluated for Climate Resilience and Adaptation:**
    - **Regular Environmental Audits:** Implementing environmental audits and resilience assessments at key stages of the project to evaluate climate-related impacts and adapt strategies as necessary.
    - **Stakeholder Feedback:** Engaging local communities and hospital staff in feedback loops to ensure that the project remains resilient and adaptable to emerging risks.

Section 5: Stakeholder Engagement

1. **Stakeholder Engagement in the Development Process:**
    - **Community and Public Health Engagement:** Involving local stakeholders, including the hospital staff, government agencies, and

nearby communities, to assess their concerns and needs regarding climate resilience.

- **Expert Consultation:** Engaging environmental consultants, climate resilience experts, and healthcare architects to integrate climate-sensitive design strategies.

2. **Communication of Climate-Related Risks and Opportunities to Stakeholders:**
    - **Workshops and Consultations:** Organizing workshops with stakeholders to discuss climate-related risks, opportunities, and mitigation strategies.
    - **Sustainability Reports:** Providing stakeholders with regular updates on climate resilience efforts, such as energy use, water conservation, and climate-proofing measures.
3. **Plans to Engage Stakeholders in the Project's Climate Resilience and Adaptation Efforts:**
    - **Continuous Feedback:** Establishing ongoing communication channels with hospital staff and local communities to ensure that climate resilience measures are implemented effectively.
    - **Training and Education:** Providing training to hospital staff on climate resilience and adaptation strategies to build awareness and capacity.

Section 6: Additional Information

1. **Other Climate-Related Risks or Opportunities:**
    - **Health Impacts:** Climate change could exacerbate public health issues, especially during extreme weather events. The hospital may consider expanding its services to address climate-related health issues such as heat stress and vector-borne diseases.
2. **Additional Comments/Suggestions:**
    - **Sustainability Certifications:** The project could pursue sustainability certifications like LEED or BREEAM to further demonstrate its commitment to environmental stewardship and climate resilience.

- **Climate Action Plan:** Developing a long-term climate action plan for the hospital to ensure that it remains adaptable to future climate risks and continues to meet healthcare demands in a changing climate.

APPENDIX: Project Climate Screening Assessment Questionnaire in Oyo State

Section 1: Project Information

1. What is the name of the project?

2. What is the location of the project?

3. What is the sector/category of the project (e.g., infrastructure, agriculture, energy)?

4. What is the estimated cost of the project?

5. What is the expected duration of the project?

Section 2: Climate-Related Risks

1. What climate-related risks have been identified for the project (e.g., flooding, drought, heat stress)?

2. How likely is it that these climate-related risks will occur?

3. What are the potential impacts of these climate-related risks on the project?

4. Are there any existing measures in place to mitigate these climate-related risks?

Section 3: Climate-Related Opportunities

1. What climate-related opportunities have been identified for the project (e.g., renewable energy, climate-resilient infrastructure)?

2. How likely is it that these climate-related opportunities will occur?

3. What are the potential benefits of these climate-related opportunities for the project?

4. Are there any existing measures in place to take advantage of these climate-related opportunities?

Section 4: Climate Resilience and Adaptation

1. What measures are being taken to ensure the project is resilient to climate-related risks?

2. Are there any plans to adapt the project to future climate-related risks?

3. How will the project be monitored and evaluated to ensure its climate resilience and adaptation?

Section 5: Stakeholder Engagement

1. Have stakeholders been engaged in the project planning and development process?

2. Have climate-related risks and opportunities been communicated to stakeholders?

3. Are there any plans to engage stakeholders in the project's climate resilience and adaptation efforts?

Section 6: Additional Information

1. Are there any other climate-related risks or opportunities that have not been identified in this questionnaire?

2. Are there any additional comments or suggestions you would like to provide regarding the project's climate resilience and adaptation?

Thank you for taking the time to complete this questionnaire. Your input is valuable in helping us to better understand the climate-related risks and opportunities associated with our projects.