

## Geopolitics of Climate Change

The geopolitics of climate change refers to how countries compete for power, resources, and influence due to climate-driven changes in trade routes, resources, and policies. In this case, climate change is reshaping global power dynamics by exposing new opportunities and risks, especially between the U.S., China, and Canada.

### How Climate Change Affects Maritime Shipping Routes & Rare Earths

- **Impact on Maritime Shipping Routes**
  - **Climate Change Effect:** Melting ice in the Arctic due to rising temperatures.
  - **Impact on Shipping:**
    - **New Routes Open:** The **Northern Sea Route (NSR)** through the Arctic is becoming more accessible, reducing shipping time between **Asia & Europe** by **40%** (compared to the Suez Canal).
    - **Existing Routes Disrupted:** **Droughts & extreme weather** (like hurricanes) are making traditional routes like the **Panama Canal** less reliable.
    - **Geopolitical Tensions:** Countries like the **U.S., China, and Russia** are competing to control these new Arctic trade routes.
    - **Example:** In 2023, a severe **drought in Panama** reduced the number of ships passing through the **Panama Canal** by **36%**, affecting global trade.
- **Impact on Rare Earth Elements (REEs)**
  - **Climate Change Effect:** Melting ice in places like **Greenland & Canada** exposes new mineral deposits.
  - **Impact on Rare Earths:**
    - **More Mining Opportunities:** Greenland is believed to have **one of the largest untapped rare earth reserves** outside China.
    - **Resource Competition:** The U.S. and China are racing to control these critical minerals, needed for **batteries, electronics, and clean energy**.
    - **Example:** The U.S. is increasing interest in Greenland because of its **rich rare earth deposits** and its strategic Arctic location.
- **Key Takeaways**
  - **Contradiction in U.S. Policy:** Trump denies climate change publicly but strategically acts on its geopolitical impacts.
  - **Focus on Climate-Affected Strategic Assets:** The U.S. is interested in the **Panama Canal, Greenland, and Canada** due to climate change effects on trade and resources.
  - **Geopolitical Rivalry with China:** The U.S. aims to control maritime routes and resource-rich regions to counter China's growing influence.
  - **Climate Change as a Security Issue:** The Pentagon and NATO view climate change as a “threat multiplier” affecting global security.
  - **Pakistan’s Vulnerability:** Pakistan's maritime trade and role in China's Belt and Road Initiative (BRI) make it sensitive to U.S.-China tensions.

- **Key Locations & Their Importance**

- **Panama Canal**

- **Climate Impact:** The canal relies on rainwater to operate. Severe drought in 2023 caused water levels to drop. This reduced the number of ships passing through by **36%**, slowing down global trade.
    - **U.S. Strategy:** China has invested **\$10 billion** in nearby alternatives, like a **Nicaragua Canal** and railway systems in **Colombia & Mexico** to compete with the Panama Canal. The U.S. sees this as a **threat to its power** in the region.
    - **Trump's Stance:** Suggests potential **military intervention** to secure control.

- **Greenland**

- **Climate Impact:** As ice melts, shorter trade routes are opening through the Arctic. The Northern Sea Route (NSR) could cut shipping times between Asia & Europe by 40%. The U.S. fears China & Russia gaining control over these new routes.
    - **Resource Richness:** These minerals are **critical for electronics, batteries, and clean energy** (e.g., electric cars & wind turbines). The **U.S. Geological Survey (USGS)** believes Greenland has **one of the largest untapped rare earth reserves** outside China.
    - **Geopolitical Rivalry:** China is **investing heavily** in Greenland's mining industry. Russia is expanding its **Arctic military presence** to secure these routes. The U.S. has **blocked China's Arctic ambitions** through **NATO's Arctic Strategy**. In 2019, Trump **offered to buy Greenland** from Denmark (which owns it) but was rejected. The U.S. is increasing **military presence** in the Arctic to counter **China & Russia**.

- **Canada**

- **Climate Impact:** Canada has **\$1 trillion worth of minerals** essential for **clean energy** (used in batteries, wind turbines, and electric cars). The **U.S. Geological Survey (USGS)** says Canada could **supply 25% of global rare earth demand**. The U.S. wants **easy access to these minerals** to reduce dependence on China. Melting ice is making **Northern shipping routes** more accessible. This could make trade **faster & cheaper** but also **increase U.S.-China competition**.
    - **U.S. Strategy:** Seeks **unhindered access** to these minerals while pushing Canada to relax **carbon taxes & climate policies**. Canada's **climate policies** (like **carbon tax & energy caps**) could **increase U.S. gas prices**.
    - **Trump's Energy Plan:** Wants to cut **gas prices by 50%**, requiring Canada to abandon its climate commitments.

- **Geopolitical Strategy to Counter China**

- **U.S. Indo-Pacific Strategy (2024):** Focuses on securing key maritime routes and resources.
  - **China's Arctic Expansion:** Investments in the Arctic have **exceeded \$90 billion**.
  - **Northern Sea Route (NSR):** China-Russia shipping route could cut Asia-Europe shipping times by **40%**.
  - **Chinese Arctic Shipping Growth:** Increased by **300% (2018-2023)**.

- **Climate Change Paradox**
  - **Trump Calls Climate Change a "Scam"** but...
  - **Pentagon (2024 Climate Adaptation Plan):** Identifies it as a "**threat multiplier**".
  - **NATO's 2022 Strategic Concept:** First time recognizing China as a "**systemic challenge**" to security.
  - **China's Response:** Promotes **economic & scientific cooperation** but warns against **militarization**.
- **Implications for Pakistan**
  - **Pakistan's Maritime Trade:** **95% of international trade** depends on global shipping routes.
  - **CPEC Investments:** **\$62 billion** in China's Belt & Road Initiative (BRI), including **Gwadar Port (\$1.1 billion Chinese investment)**.
  - **Risk of U.S. Control over Trade Routes:** Could **increase costs & delays** in Pakistan's shipping trade (**valued at \$100 billion annually**).
  - **Possible Solution:** Expand **regional trade with India & neighbors** to reduce dependency on vulnerable global routes.

### **Pakistan's Climate & Economic Strategy for 2025**

2025 is a **critical year** for Pakistan as it integrates **economic planning with climate priorities**. The country faces **climate and economic vulnerabilities** that must be tackled together. To strengthen its **climate action**, Pakistan needs to address **policy alignment, credibility gaps, financing issues, and local governance**.

#### **Key Opportunities in 2025**

- **Realigning Policy Priorities**
  - Pakistan will launch **two major plans**:
    - **13th Economic Development Plan**
    - **Third Nationally Determined Contributions (NDCs)** under the Paris Agreement.
  - These **must be aligned** so that climate targets **do not contradict economic goals**.
  - **Challenges:**
    - Past economic plans **ignored climate policies**.
    - Provincial policies (60+ sectoral policies) **need revision** to fit with national plans.
    - The Planning Commission lacks **climate experts** to integrate sustainability.
- **Embedding Climate Action in Policies**
  - Pakistan has started **climate-proofing development projects** (PC-1 to PC-V). New tools being developed:
    - **Climate-risk screening** for public projects.
    - **Budget tagging** to track climate spending.
    - **Centralized digital registry** for financial error.
  - These **tools must now be implemented**, especially at the **provincial level**, where **climate impacts hit hardest**.
- **Filling the Credibility Gap**
  - Pakistan's **climate pledges** are **unrealistic** due to:
    - **Overestimated economic growth & emissions projections**.

- Over-reliance on projects like the **10 Billion Tree Tsunami**, which lacks scientific validation. The project claims to **absorb massive amounts of carbon**, but **scientific studies** on afforestation suggest that tree plantations take **decades** to reach their full carbon sequestration potential.
    - Failure to implement **NDC 2.0** at provincial levels.
  - To access **international climate finance**, Pakistan must improve **transparency & integrity** in reporting climate actions.
- **Diversifying Financial Resources**
  - Pakistan receives **very little international climate finance**. Key actions for 2025:
    - Apply for **direct access to Green Climate & Adaptation Funds**. Currently, **Pakistan receives funding through international agencies** (like UNDP, World Bank, or ADB), which act as intermediaries. This process **Slows down project approval & fund disbursement**.
    - Introduce **carbon taxes & levies**.
    - Encourage **private sector investment** in climate projects.
    - Create **carbon trading markets** to generate revenue. (Regulatory framework, carbon pricing and capping, establishing trading system)
  - These steps will **attract foreign investment & increase financial stability**.
- **Strengthening Local Governance for Climate Action**
  - **Climate disasters hit local communities the hardest**. Pakistan must **empower local governments (LGs)** for effective climate action. **Current Issues** are
    - Top-down planning leads to **delays, corruption, and inefficiency**.
    - LGs lack funding & decision-making power.
  - Suggestion: Treat **all development as climate-resilient investment** and integrate **local solutions**.

## NDC Policies of Pakistan

**1. Pakistan's NDC Submission (2016):** Pakistan first submitted its NDC in **2016** as part of its commitment to the **Paris Agreement**. The key features of this first submission were:

- **Mitigation Target:**
  - **20% reduction in emissions** by 2030 compared to a **business-as-usual** scenario. This was a voluntary pledge, as Pakistan is not required to reduce emissions due to its status as a **developing country**.
  - The target is conditional on the availability of **international climate finance** and **technology transfer**.
- **Adaptation Focus:**
  - Pakistan highlighted its **vulnerabilities** to climate change, particularly to **water availability, agriculture, health, and coastal areas**.
  - Key adaptation goals included building **climate-resilient infrastructure**, enhancing **water management**, and improving **disaster risk reduction** strategies.

**2. Pakistan's Updated NDC (2021):** In **2021**, Pakistan submitted its **updated NDC** to the UNFCCC. This update reflects both new climate challenges and advancements in climate action. The updated NDC focuses on:

### **Mitigation (Reducing Emissions)**

- **Target to reduce emissions by 50%** by 2030, compared to the **business-as-usual** scenario, if sufficient **international support** is provided.

- **Specific sectors for mitigation:**
  - **Energy:** Transitioning to **renewable energy**, **energy efficiency**, and **decarbonizing** the energy sector.
  - **Industry:** Reducing emissions from heavy industries like **cement** and **steel**.
  - **Forestry:** Expanding efforts for **afforestation** (e.g., the **10 Billion Tree Tsunami Project**).
  - **Waste management:** Addressing emissions from **solid waste** and **landfills**.

#### **Adaptation (Building Resilience)**

- Strengthening climate resilience in vulnerable sectors such as **water resources**, **agriculture**, **coastal areas**, and **health**.
- **Climate-resilient agriculture:** Ensuring **food security** by promoting **climate-smart agriculture** practices, such as water-efficient irrigation systems and drought-resistant crops.
- **Water management:** Managing **floods** and **droughts** with better **water storage** and distribution systems, improving **irrigation** systems, and restoring wetlands.
- **Disaster risk reduction:** Reducing the impacts of extreme events like **heatwaves**, **floods**, and **cyclones**.

### **INTEGRATE OR FAIL**

#### **Climate Justice in Pakistan: Barriers & Solutions**

**Climate justice** is about ensuring that climate action is fair, inclusive, and sustainable, particularly for vulnerable communities. Pakistan, one of the most climate-vulnerable countries in the world, faces **serious** economic, demographic, and environmental challenges. Addressing these requires coordinated action and investment.

#### **Barriers to Climate Action**

##### **1. Economic Challenges**

- Pakistan's economy struggles with **mounting debt**—over **\$125 billion in external debt**—limiting funds for climate resilience.
- The **manufacturing sector's contribution to GDP** has fallen from **14% (2000)** to **12% (2023)**, reducing economic diversification and resilience.
- **Coal still accounts for 13% of the energy mix**, while **renewable energy investment is only 2.5% of GDP**, far below the regional average of 4.7%.
- **Pakistan ranks 99th out of 132 countries** in the Global Innovation Index, limiting the development of climate-smart technologies.

#### **Case Study: Bangladesh's Climate-Smart Growth Model**

Bangladesh has successfully **increased renewable energy to 10% of its energy mix** and introduced **solar irrigation pumps**, reducing reliance on fossil fuels while improving agricultural output.

##### **2. Population Growth & Urbanization**

- Pakistan's population is growing at **2.4% annually**, compared to the regional average of **1.1%**. By **2050**, the **population is projected to reach 338 million**, straining water and food resources.
- Urbanization is increasing at **3.3% annually**, yet **only 50% of urban dwellers have access to clean drinking water and proper sanitation**.
- **28% of Pakistan's population now lives in flood-prone areas**, increasing disaster risks.

### **Case Study: Karachi's Urban Flooding Crisis (2020)**

In 2020, Karachi experienced record-breaking rainfall, leading to **41 deaths and economic losses of \$500 million**. Poor drainage and unregulated urban sprawl exacerbated the disaster.

### **3. Environmental Destruction**

- **Pakistan loses 27,000 hectares of forest annually**, reducing natural carbon sinks.
- **Mangrove forests in the Indus Delta have declined by 38%** since 1980, increasing vulnerability to coastal erosion.
- **Agriculture consumes 93% of water resources** but is highly inefficient, with outdated irrigation methods leading to water wastage.

### **Case Study: Hindu Kush Glacial Melt**

Glaciers in the Hindu Kush-Karakoram region are melting **at an accelerating rate**—by 2100, **glacial mass could reduce by 36%**, impacting water availability for millions.

### **Bridges to Climate Resilience**

#### **1. A Clear Vision for Climate Action**

- Current donor-funded climate projects are fragmented, lacking coordination.
- **Only 30% of climate funds reach the most vulnerable communities** due to mismanagement.

**Solution:** Pakistan must **centralize climate planning** under a single agency and ensure transparent fund distribution.

#### **2. Strengthening Local Governments**

- The **18th Amendment gives provinces environmental responsibilities**, but they lack financial power.
- Cities like **Lahore, Karachi, and Islamabad could issue green bonds**, following Cape Town's successful model.

### **Case Study: Cape Town's Green Bond Success**

Cape Town raised **\$75 million through a green bond** to finance climate-resilient infrastructure, reducing reliance on external funding.

### **3. Water & Agricultural Resilience**

- **Climate-smart irrigation** could reduce water use by **30% while increasing yields**.
- **Pakistan's hydropower capacity is set to double by 2030**, but environmental risks must be managed.

### **Case Study: India's Solar-Powered Irrigation**

India's **KUSUM scheme** has installed **solar pumps for farmers**, reducing reliance on groundwater and fossil fuels.

#### **4. Accessing International Climate Finance**

- Pakistan needs **\$348 billion for climate action by 2030** but currently receives **less than \$1 billion per year**.
- No Pakistani institution has **direct access accreditation** to major global climate funds.

**Solution:** Fast-track accreditation with **Green Climate Fund (GCF)** and **expand risk-financing options like catastrophe bonds**.

#### **5. Engaging the Private Sector**

- **Fossil fuel subsidies exceed green energy investments**, limiting clean energy transition.
- **Green finance represents only 2% of banking sector assets** in Pakistan.

**Solution:** Implement **carbon pricing** (potential revenue: **\$2-3 billion annually**) and expand **green banking initiatives**.

## 6. Research & Data Infrastructure

- Climate research funding is **0.3% of GDP**, with less than **5% allocated for climate-specific studies**.
- **Pakistan lacks a national climate data-sharing platform** for policymakers.

**Solution:** Establish a **National Climate Research Fund** and **integrate AI-driven climate modeling**.

## 7. Mainstreaming Climate Justice

- **Every ministry must integrate climate resilience** into national policies, from infrastructure to agriculture.
- **Pakistan's climate laws exist, but enforcement is weak** due to bureaucratic inefficiencies.

**Solution:** Strengthen **legal enforcement mechanisms** and require **climate impact assessments** for all new projects.

### The Way Forward

Pakistan's **development and climate goals must align** to ensure long-term sustainability. By addressing economic, institutional, and environmental challenges, **Pakistan can build a resilient future where climate justice benefits all citizens, not just a few.**

## Pakistan and the New Emissions Trading Rules: Opportunities & Challenges

The **Baku Climate Summit** marked a turning point in global carbon markets, formally establishing two emissions trading mechanisms under **Article 6** of the Paris Agreement. These rules provide **new pathways for Pakistan** to engage in regulated emissions trading, attract climate finance, and integrate carbon markets into its Nationally Determined Contributions (NDCs).

### Key Implications for Pakistan

#### 1. Understanding the New Carbon Market Mechanisms

- **Article 6.2:** Allows **bilateral trading of Internationally Transferred Mitigation Outcomes (ITMOs)** between countries, enabling Pakistan to **sell emissions reductions** to other nations.
- **Article 6.4:** Establishes a **regulated international carbon market** under UN oversight, where private companies and governments can participate with structured accountability.

#### Pakistan's Readiness:

- Pakistan launched its **Carbon Market Policy Guidelines** in Baku to attract investment.
- The **Climate Change Ministry** is drafting **regulations, sectoral inventories, and project pipelines** to integrate carbon markets into its NDCs.
- Several private-sector companies are already negotiating **forest-based carbon offset projects** with provincial governments.

#### 2. Risks & Challenges

- **Concerns about Article 6.2:** Experts warn of **junk carbon credits** flooding the market due to weak regulations.
- **Governance Weaknesses:** Pakistan must strengthen **accountability mechanisms** to prevent **non-transparent transactions**, especially involving mangroves and forests.
- **Provincial vs. Federal Authority:** Carbon stocks are provincial assets, requiring **alignment between provinces and the federal government** on trading strategies.

#### Lessons from the Delta Blue Carbon Project (2017)

Pakistan's **first voluntary carbon market project** focused on **mangrove restoration**. It

demonstrated potential but also highlighted challenges in ensuring **fair revenue distribution** and **long-term monitoring of carbon sequestration claims**.

### 3. A Three-Track Carbon Strategy for Pakistan

#### Track 1: Nature-Based Carbon Projects

- Mangroves, forests, and biodiversity-based carbon offsets.
- **Challenge:** Need for scientific **baselines of carbon stocks** at the provincial level.

#### Track 2: Sectoral Emissions Trading

- Focus on **energy, industry, agriculture, construction, and waste management**.
- **Challenge:** Aligning provincial **carbon pricing mechanisms** with national policies.

#### Track 3: Air Pollution & Urban Carbon Markets

- **Case Study: Thailand-Switzerland Bangkok E-Bus Programme (2022)**
  - A **bilateral emissions trading agreement** under **Article 6**.
  - Aims to reduce **500,000 tonnes of CO<sub>2</sub>** by 2030 through **electric buses**.
  - **Funded by Switzerland's KliK Foundation**, which buys ITMOs at **\$30 per credit**.

#### Potential for Lahore

- Lahore emits **7.65 million metric tons of CO<sub>2</sub>**, with **83% from transport** (Urban Unit, 2023).
- A similar **E-Bus programme**, financed through carbon trading, could:
  - Cut emissions.
  - Improve air quality.
  - Leverage **private-sector investment**.

### 4. Strengthening Pakistan's Carbon Market Ecosystem

#### Regulatory Framework

- Pakistan must **fast-track carbon market regulations** to ensure credibility.
- **Transparency measures** to prevent misuse of carbon credits.

#### Proponent Mobilization

- Provinces must **coordinate sectoral priorities** for carbon trading.
- Encourage **private-sector participation** through incentives.

#### Financing Mechanisms

- Secure funding from **global climate finance institutions**.
- Explore **bilateral carbon trading agreements** (e.g., with EU, Gulf countries).

#### The Path Forward

Pakistan must **move quickly to capitalize on the new emissions trading framework** while ensuring strong governance. A well-regulated carbon market can **attract investment, reduce emissions, and integrate with global carbon markets**—but only if Pakistan establishes a **transparent, science-backed, and enforceable trading system**.