Eco-Friendly Public Health Practices

A Systems Approach to Sustainable Well-Being

BY

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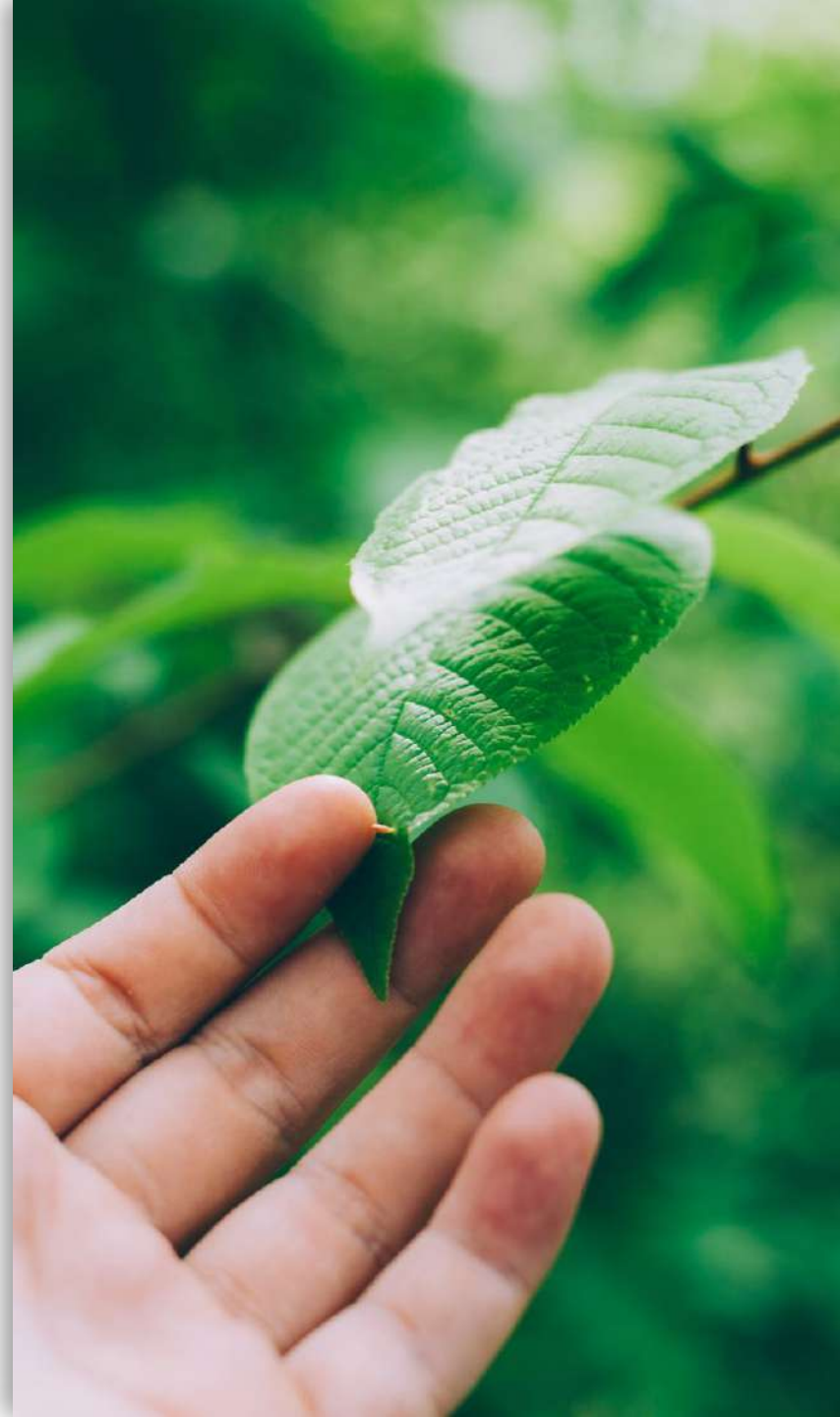
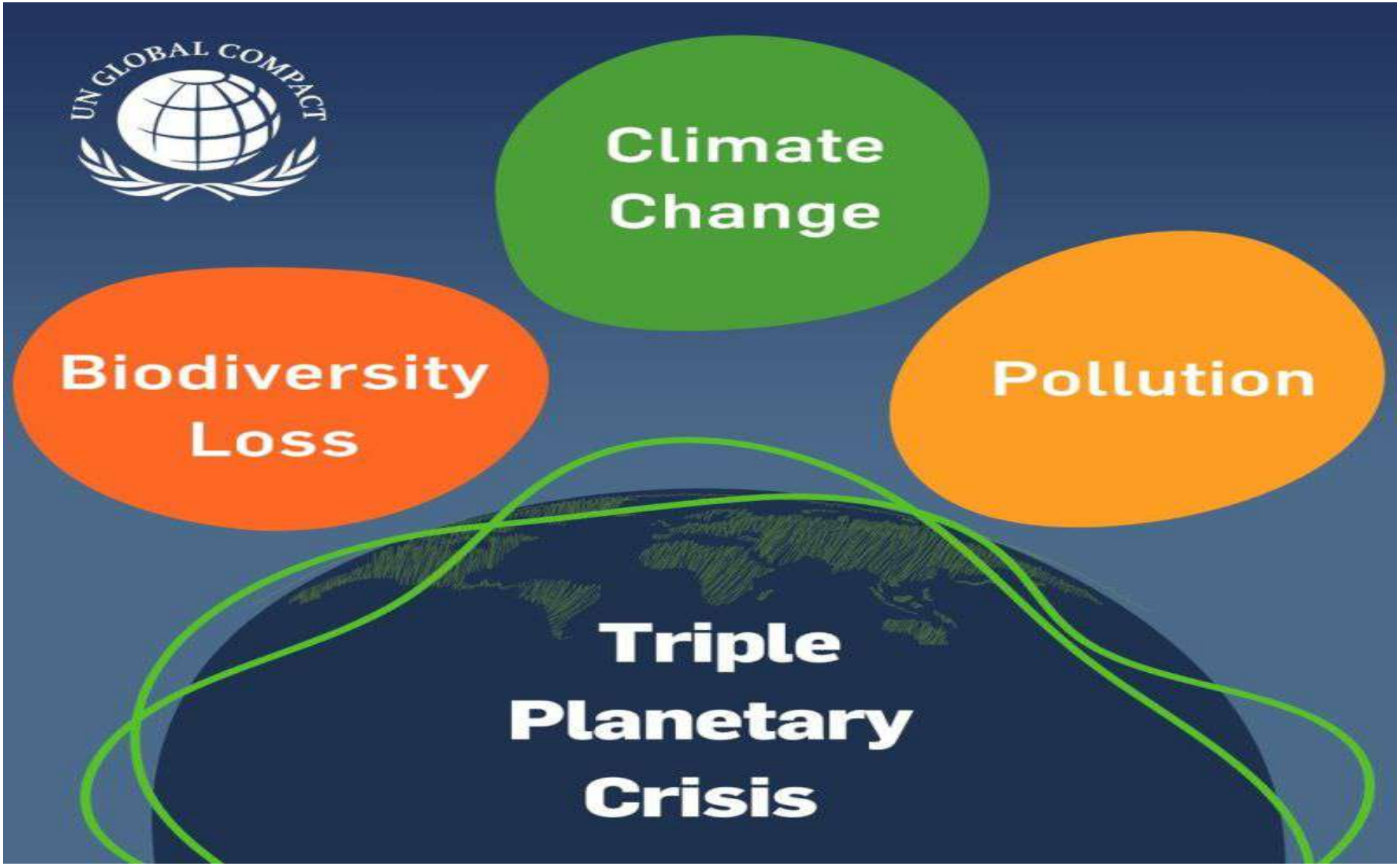


By the end of this presentation, participants will be able to:

- Define the concept of eco-friendly public health and.
- Identify major environmental challenges related to healthcare systems (e.g., carbon emissions, medical waste, water pollution).
- Describe key eco-friendly practices in public health.
- Evaluate current national initiatives and community-based interventions promoting eco-health.
- Propose strategies to embed sustainability into public health planning, policy, and professional practice.

Context & Need for Eco-Friendly Public Health



Climate change is the biggest threat to health in the 21st century.

Source: World Heath Organisation

Public health systems are both victims and contributors to environmental degradation

Public health systems as victims of Environmental Degradation

Increased disease burden: Health systems face rising cases of:

- Heat-related illnesses: Heatwaves can cause heat stroke, dehydration, and death, especially among vulnerable populations (elderly, children, chronically ill).
- Respiratory illnesses: Air pollution and wildfires worsen conditions like asthma and chronic obstructive pulmonary disease (COPD).
- Vector-borne diseases: Warmer temperatures and altered rainfall patterns expand the habitats of disease-carrying vectors and increasing the spread of diseases such as malaria, dengue, Zika virus, and Lyme disease.
- Food insecurity → due to droughts or storms ruining crops, leading to hunger and malnutrition.
- Mental health issues → from displacement, disasters, or constant stress about climate conditions.

Public health systems as victims of Environmental Degradation

Infrastructure damage: Extreme weather events (floods, hurricanes, wildfires) can damage hospitals and clinics, disrupt supply chains, and reduce access to care.

Strain on resources: More frequent emergencies and outbreaks put pressure on already stretched resources, especially in low- and middle-income countries.

Health inequality: Vulnerable populations (e.g., poor, elderly, chronically ill) are disproportionately affected, requiring greater public health response.

Public health systems as Contributors to Environmental Degradation

Carbon emissions

Medical waste

Supply chains

Over-medicalization: excessive or unnecessary medical interventions can lead to **resource waste and environmental impact**.

Environmental Burden of Healthcare

1- Healthcare carbon emissions (Globally, healthcare contributes around 4.4% of net greenhouse gas emissions)

- Hospitals consume large amounts of energy to run 24/7—lighting, air conditioning, sterilization, and machines like MRIs and ventilators.
- Patient and staff travel to clinics by car, ambulance, or plane increases fuel use and emissions.
- Medical supply chains (e.g., producing, packaging, and shipping medicines and equipment) also use fossil fuels.

Environmental Burden of Healthcare

2- Pharmaceutical pollution in water systems: Unused or excreted medications enter water bodies through sewage or hospital discharge. These chemicals don't break down easily and can remain in the environment for years.

Harm to aquatic life:

✓ Hormones (like estrogen) cause fish to change sex;

✓Antibiotics promote resistant bacteria in rivers.

✓Disruption of ecosystems.

🧪 Examples: Antibiotic residues found in Egypt's Nile River& India's rivers. Painkiller diclofenac in water led to a 90% decline in vulture populations in South Asia.

Environmental Burden of Healthcare

Medical waste often contains materials with heavy metals

Mercury (from broken thermometers, dental amalgam)

Lead and cadmium (from batteries, devices, chemicals).

These metals do not break down and can:

- Damage the brain, kidneys, and nervous system
- Contaminate soil and water
- Harm wildlife and plants

 Example: Improperly incinerated waste from old medical devices may release mercury vapor, which is toxic when inhaled and dangerous to ecosystems.

This dual perspective is critical in achieving eco-friendly, climate-resilient health systems for the future.

Eco-Friendly Public Health

- Holistic approach that integrates health promotion with environmental stewardship to ensure sustainable well-being for both people and the planet.

- It moves beyond treating illness to preventing harm through sustainable, health-promoting systems.

Core Goals

- Protect Human Health
  - Address root causes of disease linked to environmental factors (e.g., pollution, climate change).
  - Promote clean air, safe water, nutritious food, and healthy built environments.
- Reduce the Health System's Environmental Footprint
  - Eco-friendly initiatives aim to:
    - Minimize waste and energy use in hospitals.
    - Use sustainable medical supplies.
    - Reduce pharmaceutical pollution.
- Build Resilience to Environmental Threats
  - Prepare health systems for climate-related disasters (e.g., heatwaves, floods).
  - Support community adaptation to changing environmental conditions (e.g., vector-borne disease shifts, food insecurity).

Holistic Principle

- One Health: Recognizes that human, animal, and environmental health are interconnected.
- Sustainable Development Goals (SDGs) alignment—especially
  - ❖ SDG 3 (Good Health and Well-being),
  - ❖ SDG 6 (Clean Water and Sanitation),
  - ❖ SDG 13 (Climate Action).
- Equity: Ensures that vulnerable populations aren't left behind in climate and health initiatives.

Eco-Friendly Public Health Practices

1-Sustainable Design of Health Facilities

Green hospital architecture:

Case: Khoo Teck Puat Hospital, Singapore

1-Sustainable Design of Health Facilities

Green hospital architecture is the design and construction of healthcare facilities in a way that

- ✓ Minimizes environmental impact,
- ✓ Optimizes energy use, and
- ✓ Promotes health and healing for patients, staff, and the community.♻

- ☀️ Solar Energy Photovoltaic panels generate clean electricity used for lighting, heating water, or` running equipment.
- 🌬️ Natural Ventilation Promotes fresh airflow, reducing the need for air conditioning and Lowers energy
- ⚡ Renewable Energy Integration Includes solar, geothermal, and wind energy systems.
- 🌿 Energy-efficient systems: Smart design reduces energy demand through passive design (e.g., natural lighting, insulation).

2-Sustainable Procurement & Supply Chains

- ✓ Life cycle assessment of medical products:
- ✓ Ethical, local sourcing
- ✓ WHO Green Procurement Guidelines

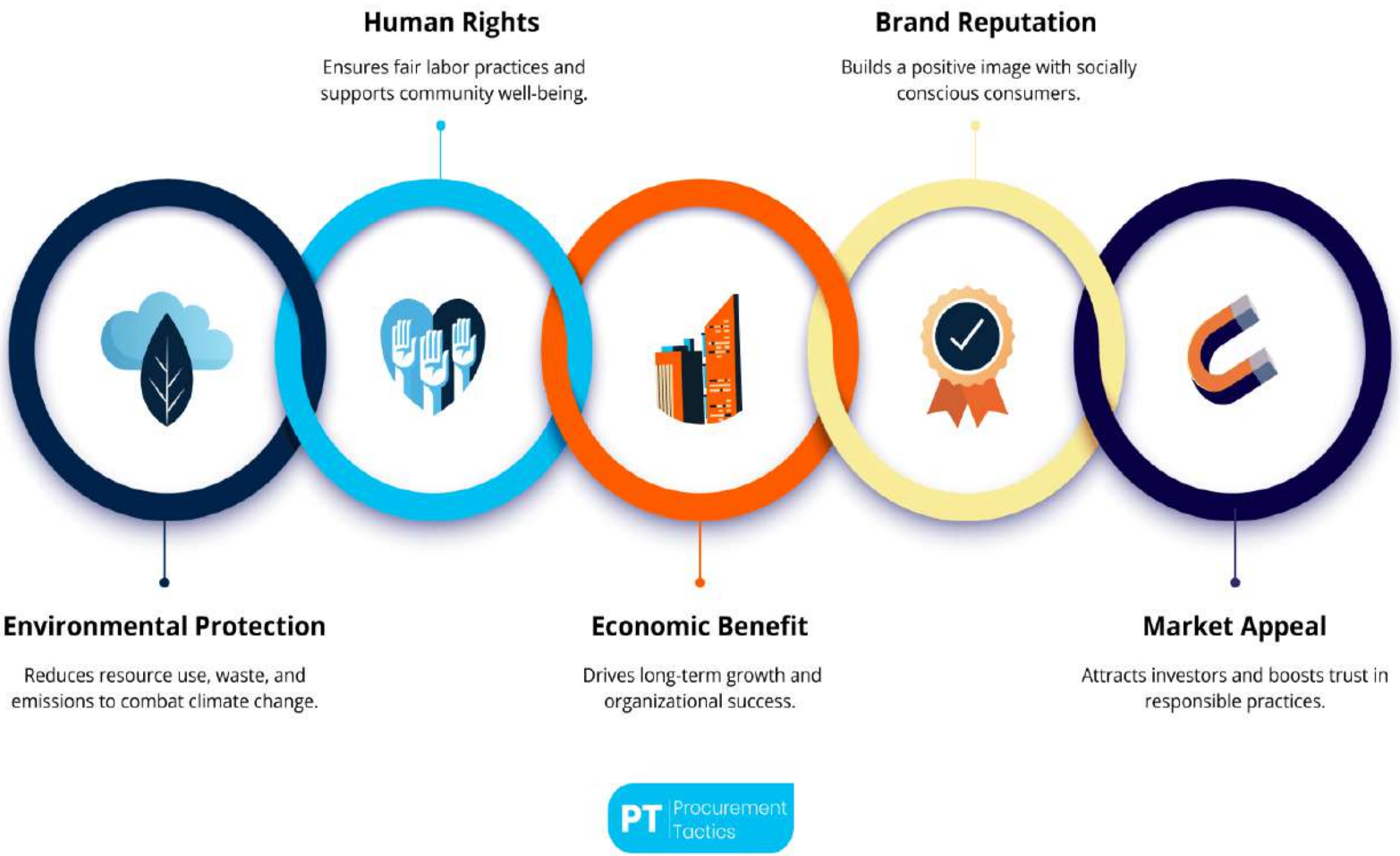
2-Sustainable Procurement & Supply Chains

- Life Cycle Assessment (LCA) is a scientific method used to evaluate the environmental impact of a product throughout its entire life cycle, from raw material extraction to disposal.

In Public Health:

- Identifies hotspots of environmental harm in medical supply chains.
- Supports eco-design (e.g., reusable or recyclable products).
- Reduces healthcare's carbon footprint without compromising care quality.

Ethical & Local Sourcing:



WHO Green Procurement Guidelines for the Health Sector

✅ Goal: Ensure that procurement aligns with health goals without harming the environment, promoting a circular economy in healthcare.

🔑 Key Principles:

- Avoid hazardous substances.
- Favor products with lower energy and water use.
- Choose reusable or recyclable items.
- Select suppliers committed to sustainability.

WHO Green Procurement Guidelines for the Health Sector

🛠️ Application Areas:

- Medical equipment
- Pharmaceuticals
- Cleaning products
- Office and hospital furniture

A public hospital adopts WHO's Green Procurement Guidelines to purchase:

✓ Reusable surgical instruments instead of disposables
✓ Latex-free and PVC-free gloves
✓ Locally sourced medical textiles to reduce transportation emissions


Carbon positivity
Land use
Water use
Circular resources
ENVIRONMENT
Sustainable Procurement
Consumer wellbeing
ECONOMY
SOCIETY
Empowered individuals
Fair business
Healthy community

3-Medical Waste Management

🚮 Segregation at Source: Critical for Safety & Sustainability

- Definition: Sorting healthcare waste at the point of generation (e.g., patient rooms, labs) into correct catego
  - ✓ Prevents contamination of recyclable or reusable material
  - ✓ Protects waste handlers and the environment from hazarc exposure.
  - ✓ Makes downstream recycling, sterilization, or disposal mo effective and less costly.

✅ Example: Color-coded bins in hospitals make it easier for staff to dispose of waste correctly.

3-Medical Waste Management

- Eco-practices:

✓ Autoclaving, Alternative to incineration, which releases toxic emissions (e.g., dioxins, heavy metals).

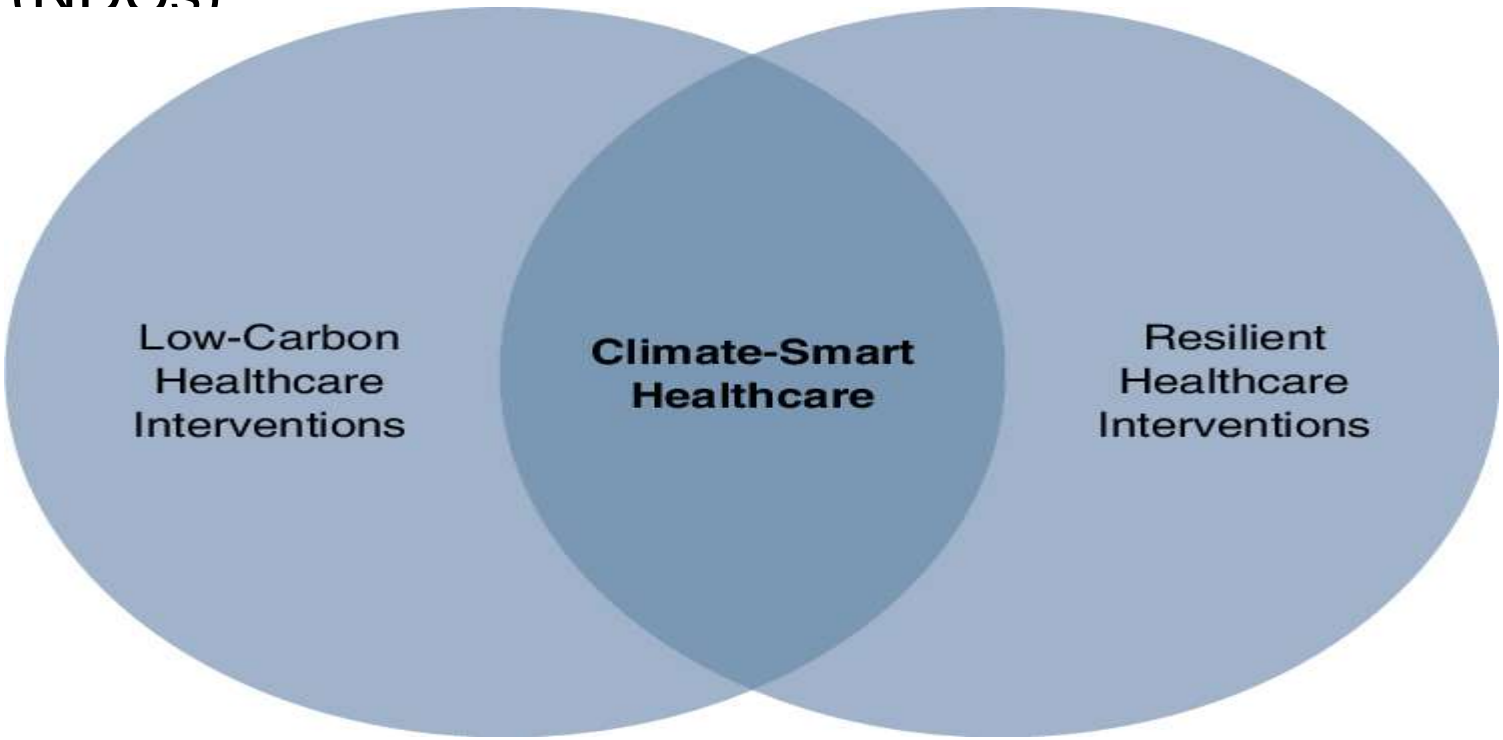
✓ Mercury-free devices, Prevents mercury spills in hospitals and avoids the high cost of cleanup and disposal.

✓ e-waste recycling

- Prevents toxic substances like lead, cadmium, and brominated plastics from entering landfills.
- Enables material recovery (metals, plastics) and reduces resource

4-Climate-Smart Healthcare

- Resilience infrastructure & disease tracking
- Early warning systems for climate-sensitive diseases
- Integration into National Determined Contributions (NDCs)



Resilience

Refers to the health system's ability to withstand and recover from climate-related shocks (e.g., floods, heatwaves, disease outbreaks).

- Climate-resilient infrastructure:
  - Designing hospitals that resist extreme weather (e.g., raised foundations for floods, cooling systems for heatwaves).
  - Ensuring backup systems for power and water.
- Disease surveillance and tracking:
  - Strengthening health information systems to monitor disease patterns linked to climate (like malaria or dengue).
  - Developing predictive tools using environmental data (e.g., temperature, rainfall) to detect risks early.

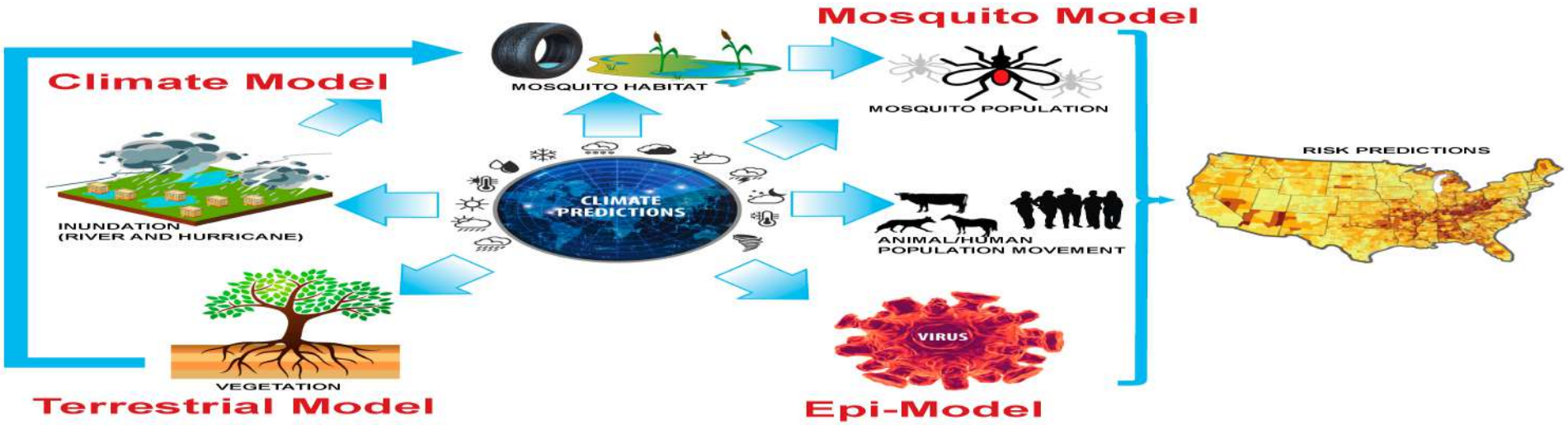
Early Warning Systems for Climate-Sensitive Diseases

These systems integrate:

- Meteorological data (rainfall, humidity, temperature).
- Epidemiological data (incidence of vector-borne and waterborne diseases).

They help in:

- Predicting outbreaks before they happen.
- Enabling timely response (e.g., mosquito control before a dengue outbreak).



🌱 Integration into Nationally Determined Contributions (NDCs)

NDCs are climate action plans under the Paris Agreement.

- By including climate-smart healthcare in NDCs, Countries :
  - Commit to greening healthcare systems.
  - Align health policies with national climate goals.
  - Mobilize funding and international support for sustainable health system

NDC PARTNERSHIP

ACCELERATING CLIMATE AND DEVELOPMENT ACTION

5-Community-Based Eco-Health Interventions

- Local planning, ecosystem-based adaptation
- Green urban spaces:

🗺️ Local Planning & Ecosystem-Based Adaptation

🌿 Ecosystem-Based Adaptation (EbA)

- This approach uses natural ecosystems to reduce climate risks and provide co-benefits to health and biodiversity.

Example:

- Mangroves in Nile Delta protect coastal communities from storm surges, reduce flooding, filter water, and support fisheries

🌳 Green Urban Spaces

- Urban green spaces—like parks, green roofs, and tree-lined streets—are vital for both climate adaptation and mental & physical health.

🧠 Mental Health Benefits:

- Exposure to green spaces reduces stress, anxiety, and depression.
- Encourages physical activity, social interaction, and well-being.

🌡️ Temperature Regulation:

- Vegetation cools cities through shade and evapotranspiration, combating the urban heat island effect.
- This reduces heat-related illness and energy demand for cooling.

🌿 Example: “EcoSan Toilets” & Organic Farming – Uganda

EcoSan (Ecological Sanitation) toilets were built in villages. These dry toilets convert human waste into safe compost through natural decomposition. The compost is used by local farmers to fertilize crops o

6-Active & Sustainable Mobility

- Walking/cycling
- Urban design
- WHO's HEAT tool estimates public health benefits

✅ Health Benefits of walking/cycling

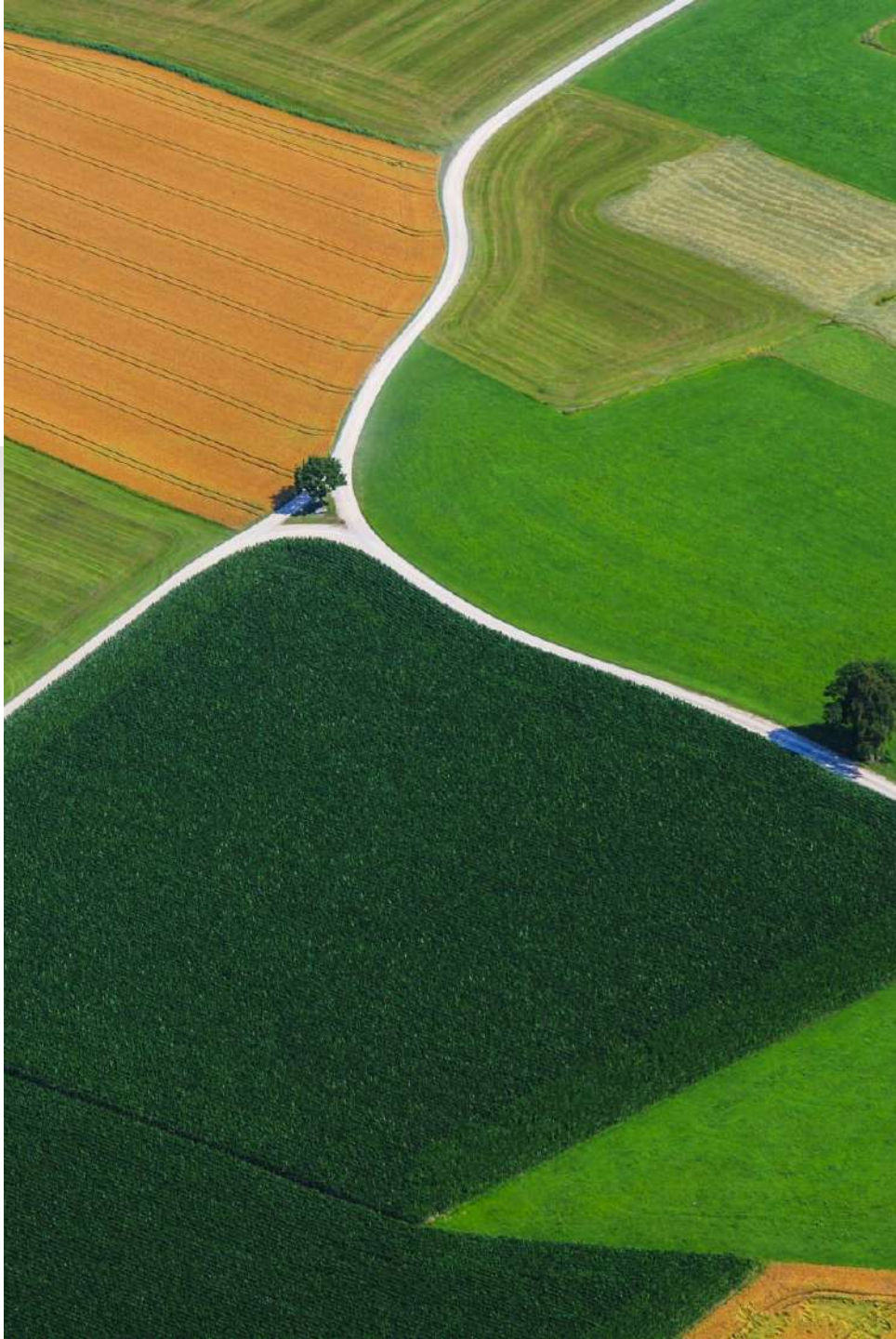
Physical activity: Walking and cycling reduce risks of cardiovascular disease, obesity, diabetes, and depression.

Mental health: Active commuting is linked to lower stress levels and improved mood.

Cleaner air: Less motorized traffic means reduced exposure to air pollutants, benefiting respiratory health.

🌍 Climate Benefits of walking/cycling

- Zero-emission transport: Walking and cycling produce no greenhouse gases.
- Reduced fuel demand: Lowers fossil fuel consumption and urban heat emissions.
- Lower infrastructure footprint: Requires less space and fewer materials compared to roads and car parks.

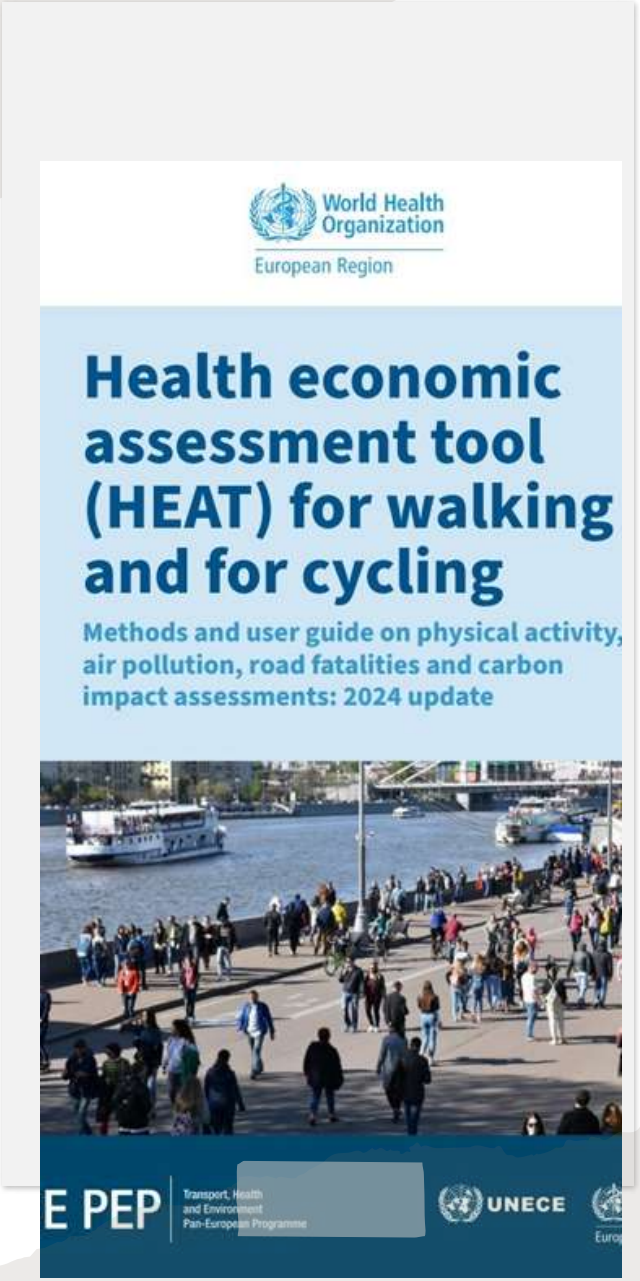


Urban Design Support:

- Bike lanes & pedestrian paths: Encourage safe and accessible active travel, Improves safety, reduces congestion, and lowers emissions.
- Mixed-use zoning: is a type of urban planning that allows residential, commercial, and recreational spaces to coexist within the same area or neighborhood that promotes shorter trips that can be made by walking or biking.

WHO's Health Economic Assessment Tool:

- Estimates economic value of health benefits from walking and cycling.
- Based on reduced mortality from increased physical activity.
- Helps policy-makers justify investments in active transport by showing long-term savings in healthcare costs and improved population health.



 WHO's Health Economic Assessment Tool:

- Example:

  A city investing in bike infrastructure may use the HEAT tool to show that a 10% increase in cycling could save millions annually in reduced premature deaths and medical costs—while also cutting CO_2 emissions significantly.

Eco-Friendly Public Health Campaigns

- Digital health promotion, reduce material waste
- Support community gardens, sustainable diets
- Reduce misinformation, panic-driven waste

- **Targeted Campaign Topics**
- Air pollution & respiratory health (e.g., “Breathe Easy” campaigns)
- Green diets (plant-based eating for health & planet)
- Safe water & sanitation (eco-toilets, water reuse)
- Heatwave preparedness with green cooling methods (shaded areas, hydration)

Eco-Friendly Public Health Campaigns

- "Walk It Green"

  The International Day of Walking is celebrated on Octobe 15th.
- Plastic-Free Health
  Encourages using reusable PPE alternatives, eco-packagi for meds, and community clean-ups.
- International plastic bag free day is observed all around th world on July 3rd.
- WHO's "Our Planet, Our Health"
  Focused on creating "well-being societies" by reducing environmental harm and enhancing equitable health systems.
- World health day celebrated annually and each year on April 7th

(*“Get Ready for Green... for a Better Future”*)
" اتحضر للأخضر... من أجل مستقبل أفضل "

- "اتحضر للأخضر" is Egypt's first national environmental awareness campaign, launched by the Ministry of Environment under the presidency of Abdel Fattah El-Sisi.

It aims to promote eco-conscious behavior and support sustainable development as part of Egypt’s Vision 2030.

(*"Get Ready for Green... for a Better Future"*)
" اتحضر للأخضر... من أجل مستقبل أفضل "

Main Campaign Pillars:

- Waste Management: Reducing plastic use, promoting recycling.
- Air Quality & Clean Energy: Encouraging solar power and public transport.
- Biodiversity: Protecting natural reserves and endangered species.
- Green Economy: Supporting green jobs and sustainable industries.
- Climate Change Action: Raising resilience to climate impacts.

Egypt: Current Situation & Progress

✅ 1. Governmental Commitment

- Egypt has shown strong political will by:
  - Launching the “) ”اتحضر للأخضرGet Ready for Green) national campaign
  - Hosting COP27 (Conference of the Parties (COP) to the United Na Framework Convention on Climate Change (UNFCCC)) in Sharm El-Sheikh (2022), highlighting its climate leadership
  - Including sustainable development as a core part of Vision 2030

Egypt: Current Situation & Progress

✅ 2. Progress in Key Sectors

🏥 Healthcare & Green Hospitals:

- The Ministry of Health and Population has collaborated with development partners (e.g., WHO, UNDP) to assess and green hospital infrastructure.

🏥 Example:

- Sharkia Governorate: A model hospital integrated solar panels, LED lighting, natural ventilation, and waste segregation systems.
- Aswan Heart Centre (by Magdi Yacoub Foundation): Known for energy-efficient design, water-saving systems, and green landscaping.

Egypt: Current Situation & Progress

🚮 Waste Management & Recycling

- The government launched a new solid waste management system to:
  - Promote waste sorting at source
  - Increase recycling rates
  - Phase out single-use plastics (e.g., in Red Sea governorates)
- Cairo, Alexandria, and Giza have seen pilot projects with new bins, upgraded equipment, and citizen education.
- Several waste-to-energy plants are planned, including one in Giza

Egypt: Current Situation & Progress

🚆 Sustainable Transport

- Major investments in:
  - Electric buses in Cairo and New Capital
  - Monorail and light rail projects
  - Bike-sharing pilot programs (e.g., Cairo Bike).

Egypt: Current Situation & Progress

🌿 Energy & Emissions

- Egypt's renewable energy mix is growing:
  - Projects like Benban Solar Park (one of the world's largest) targets to reach 42% renewables by 2035

⚠️ Challenges to Address

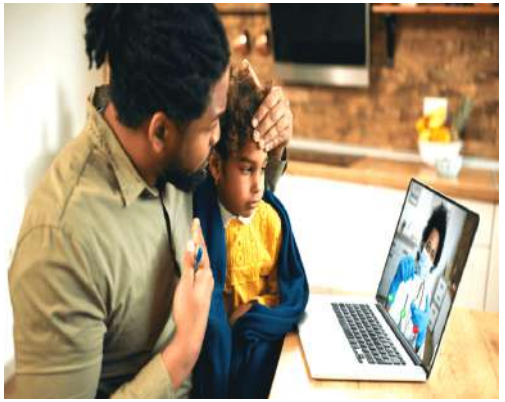
- Low public awareness and environmental education
- Weak enforcement of environmental regulations
- Insufficient integration of sustainability into health and education policies
- Urban planning still favors cars over walkability and green spaces
- Funding,
- Institutional inertia
- Low environmental literacy among professionals
- Fragmented monitoring systems.

📈 Opportunities for Improvement

- Expand climate-smart healthcare systems
- Introduce environmental impact assessments (EIAs) in all infrastructure projects
- Support community-based eco-health projects
- Integrate climate and health into the national curricula and health strategies
- Train workforce in climate/environmental health
- Fund research and innovation in green health

Opportunities for Innovation

- Telemedicine,
- Solar clinics,
- Smart resource use,
- Youth-led eco-health initiatives,
- AI and Internet of Things (IoT) for efficient systems



🏥 Healthcare Example:

- Smart hospital beds detect patient movement and alert staff, Wearable devices (IoT) monitor heart rate and send alerts for arrhythmias, AI triage systems prioritize emergency care based on real-time data

🚑 Public Health Systems

- AI predicts disease outbreaks using data from IoT health sensors, weather, and mobility

Conclusion

- ✓ No healthy population without a healthy planet
- ✓ Eco-health is essential, not optional
- ✓ Future of health is green 🌱

References

- WHO, UNEP, IPCC, Lancet Countdown, BMJ Planetary Health
- Global and national policy documents, case studies


thank you