

Conceptual ADB Framework for an AI/ML-Powered Climate and Health Global Technical Assistance Platform

Focus	Mitigation			Cross Cutting Areas	Adaptation and Resilience		Fundamentals
	Measurement	Reductions	Removal		Hazard Forecasting	Vulnerability & Exposure Management	
SUBTOPICS & EXAMPLES	Macro - Level Measurement (e.g.) Quantification of: - Health outcomes - Improved health system resiliency - Health system emission inventory at national levels - Policy impact assessments	Reduction of Green House Gas (GHG) Emissions Intensity (e.g.) Improve overall energy efficiency of health care systems through diverse mitigation interventions that also enhance health system resiliency, including solarization of health care facilities, digitization of supply chains, climate neutral pharmaceutical production.	Environmental Removal Prevent & mitigate habitat destruction, food supply system disruption (food security, water systems, and other ecosystem disruptions that accelerate climate change impacts on health.	Interventions that can be considered as both Climate Change "Mitigation" and "Adaptation" Measures (e.g. Health Systems Resiliency; Innovation Ecosystems, etc.)	Projected Regionalized Long-Term Trends - Long - range forecasting (5 - 10 years) of climate change impacts on health to inform policy and regulatory planning and reform as well as investment planning. - Implementation of regional climate change observatories.	Preparedness & Response - Advance climate-resilient holistic One-Health preparedness and response capacities in regions that are highly vulnerable to climate change impacts on health.	Equitable Solutions for Vulnerable Population - Regionally relevant, fit for purpose solutions that are equitable and sustainable in geographic, social and population contexts.
	Micro - Level Measurement (e.g.) Quantification of: - Carbon footprint of individual health systems & intelligent supply chains and digitization - EcoDesign enabled take-make-dispose-cycle refurbishing and novel procurement impact - Carbon friendly design and development of pharmaceuticals impact	Research & Development to Reduce GHG Emissions Effects Catalyze research & development in all health system areas that accelerate reduction of health care sector emissions, including advancements in green building design, energy efficiency through renewables, highly efficient HVAC systems, medical waste management, supply chain decarbonization, digital health, anesthetic gas alternatives, carbon capture innovation, other.	Technological Removal - Link carbon capture and removal storage sites (CCS) with large hospital systems and pharmaceutical production sistses. - Develop economic models that enable health system adoption of CO2 removal to CCS (this approach is likely most viable in high income countries). - CCS is still considered as highly costly, energy intensive, has an uncertain environmental impact, and is frequently not welcome by local communities. - Investing in CCS may divert resources from more effective climate solutions.		Early Warning Systems - One-Health outbreak early warning prediction and forecasting for climate sensitive diseases; weather; flood; and heat integrated with national and pan-regional preparedness and response.	Health System Resiliency - Establish health systems that are highly resistant to climate change, including low carbon infrastructures, supply chains and trained health workforce. - Catalyze inter-sectoral coordination and shared preparedness and response capacities. - Promote enabling policy and regulatory reform.	Sustained Climate Finance - Sustained climate and health finance that catalyzes health system resiliency and sustainability.
					Climate Research & Modeling - Develop complex simulations and models that simulate climate and health disaster scenarios informing ADB on potential outcomes and preventative strategies.	Health Innovation Ecosystems - Catalyze and strengthen climate and health innovation ecosystems. - Increase flow of climate finance into health innovations to incentivize private sector engagement in vulnerable regions.	Social & Behavioral Change - Catalyze social and behavioral change through promoting climate and health literacy at the individual, community, urban and national levels.
							Stakeholder Informed - Stakeholder informed intervention to assure relevancy and maximized impact of interventions in diverse settings
AI / ML INFORMS MITIGATION & ADAPTATION	Climate & Health SME Search & Discovery - AI/ML algorithms allow for optimized discovery of SME's and composition of SME teams relevant to CCxH mitigation and adaptation projects. - Inform stakeholder engagement and collaboration - Catalyze knowledge ecosystems and communities - Enhance decision support tools			  	Strengthen National, Regional & Supranational Policy & Decision Making - Policy & climate risk analytics. - Predictive analytics modeling effects of policy interventions on climate change mitigation & adaptation. - Inform regional policy coordination & alignment. - Resource allocation and prioritization to capacity building.		Enhance ADB Monitoring Evaluation & Learning (MEL) Frameworks & Validate Finance Impact Indicators - Systematically implement MEL frameworks that measure effectiveness of interventions, their sustainability in varying regional settings over time providing high resolution performance indicators indicators. - Through AI/ML identify & model which strategies are most effective under specific conditions, informing future project design and implementation. - Leverage historical data, real-time program performance and where gaps exist counterfactual data to measure impact indicators such as decrease in carbon emissions, habitat destruction, improved access to health care for vulnerable populations, advancements in climate resilient health infrastructure.
	Gather, Collect, Validate & Analyze Climate & Health Reference Data - Regional climate dynamics - Sattelite & Internet of Things - Environmental, population, social deprivation; wildlife & animal populations data and other anthropogenic impact data. - Address regional data sparcity or gaps through counterfactual modeling and analysis.				Enable Collaborative Ecosystems & Stalkeholder Engagements - Continuous stakeholder engagement and co-creation to assure transparency and trust building. - Simulate outcomes to inform context specific adaptation throughout project execution to varying and evolving project imeplementation dynamics.		
	Inform ADB Climate & Health Financing Strategy - Analyze vast/diverse data sets to provide investment risk assessment and outcome scenarios in multisectoral portfolio settings - Risk mitigation: optimize the design of adaptation and mitigation measures under various climate, and environmental scenarios. - Predict and monitor cost effectiveness of investments.						
	Optimize Climate Resilient Infrastructure & Supply Chains - Climate resilient systemic, intersectoral preparedness and response capacities. - Diversification of local manufacturing of pharmaceuticals and health system supplies. - Strategic stockpiles of essential medical supplies. - Data transparency & real time information sharing & risk assessment.						

Adapted from original framework by BCG "Tackling Climate Change with Machine Learning" & Global Partnership on AI "Climate Change and AI: Recommendations for Government Action"