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Health Care Without Harm

Resilient Health Systems in Asia

A Guide to Contextualizing Climate Vulnerability Assessment Tools for Local Needs

January 2025

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Introduction

> **Climate Change is the greatest health threat to global health in the 21st Century.**
>
> **- Managing the Health Effects of Climate Change, The Lancet (2009)**

Section 1
INTRODUCTION

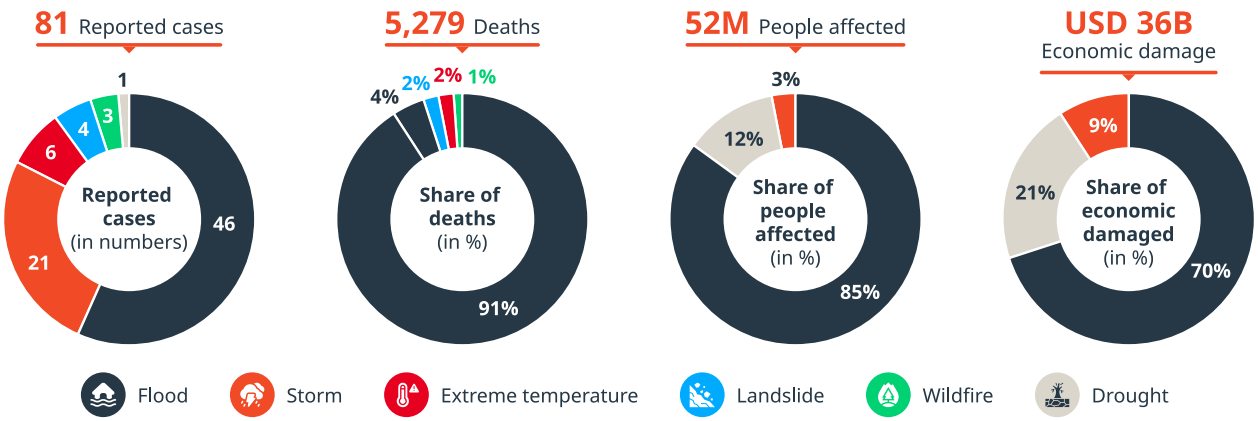
1.1 Climate change and its impact on Health and Health Care Systems

Climate change poses a profound threat to healthcare systems worldwide, with extreme weather events such as floods, heatwaves, and wildfires not only driving illness, mortality, and mental health challenges but also disrupting critical healthcare services when they are most needed. These events strain infrastructure, damage facilities, interrupt supply chains, and exacerbate disease spread, leaving vulnerable populations, including women, children, and the elderly, at heightened risk.

Human-driven climate change increased hospital damage risk by 41% from 1990 to 2020, according to a 2023 Cross Dependency Initiative report. Over 5,800 hospitals in South Asia face high shutdown risk under a 4.3°C warming scenario. In 2023, floods and landslides closed 12 healthcare facilities in southern Thailand, while Pakistan's 2022 floods disrupted 1,460 facilities, about 10% of its total.[1]

Asia is at the forefront of the climate crisis. Countries like Vietnam, Myanmar, the Philippines, Bangladesh, Pakistan, and Thailand are experiencing surging natural disasters. In 2022 alone, over 80 disasters impacted 50 million people and claimed 5,000 lives (the World Meteorological Organization: WMO). Asia's vast population and geographical diversity amplify its vulnerability. In 2023, the region recorded its second warmest year on record, with temperatures 0.91°C above the 1991–2020 average (WMO). Reports from the Intergovernmental Panel on Climate Change (IPCC)[2] and WMO[3] reveal significant glacier loss and warming trends in the Himalayas, further intensifying disaster risks. Southeast Asia is particularly susceptible to droughts, cyclones, and floods, with countries like Myanmar, the Philippines, and Bangladesh ranked among the most at-risk globally.

Figure 1. Natural disasters and their effects in Asian countries, 2022



Source: State of Climate in Asia, World Meteorological Organization, 2023

1 Operational framework for building climate change resilient health systems. Geneva: World Health Organization (WHO);2015.
2 Chapter 10: Asia. IPCC; No date.
3 State of the Climate in Asia 2023. Geneva: World Meteorological Organization; 2024

Recent Events

- Ferocious typhoon Yagi destroyed health care facilities in Vietnam in 2024. Many hospitals in northern Vietnam's Quang Ninh Province endured extensive damage caused by deadly typhoon Yagi, with power and water systems at several facilities completely knocked out.[4]
- In November 2023, 14 hospitals in Thailand reported damage due to an earthquake in neighboring Myanmar. Services remained suspended for a few days.[5]

These climate-driven events severely disrupt healthcare systems, increasing the risk of preventable harm and deaths. In countries such as the Philippines and Indonesia, frequent disasters have compounded challenges from air pollution, food insecurity, water scarcity, and infectious disease outbreaks. Health workers face immense pressure as they strive to meet rising demands, while disasters—responsible for displacing over 60% of people globally in 2021—contribute to escalating mental health crises.[6]

The COVID-19 pandemic further underscored these vulnerabilities, as disruptions in healthcare services led to increased mortality and substantial backlogs in care. Adding to the challenge, the healthcare sector itself contributes approximately 5% of global greenhouse gas emissions. Reducing this footprint is imperative. For instance, transitioning to low-impact alternatives like sustainable anesthetics can significantly mitigate emissions.

Urgent and coordinated action is needed to build climate-resilient healthcare systems that protect lives, sustain services, and address the sector's environmental impact.

1.2 Climate Resilience

Climate resilience enables health systems to adapt effectively to climate change-related risks. Climate resilience in health care facilities involves developing their capacity to monitor the operations of facilities regularly for early detection of existing vulnerabilities that could be exacerbated by climate hazards such as floods, storms, or heat waves. It also emphasizes building their ability to anticipate potential risks and prepare effective adaptation plans against climate-related challenges that hamper the delivery of critical health services.

Climate-resilient healthcare systems are those that proactively adapt to climate risks. They achieve this by:

- Identifying vulnerabilities: Pinpointing areas within the health system most susceptible to climate impacts.
- Monitoring and forecasting: Anticipating potential climate-related hazards and their consequences.
- Implementing adaptation plans: Ensuring the continued delivery of critical health services during and after climate disruptions.

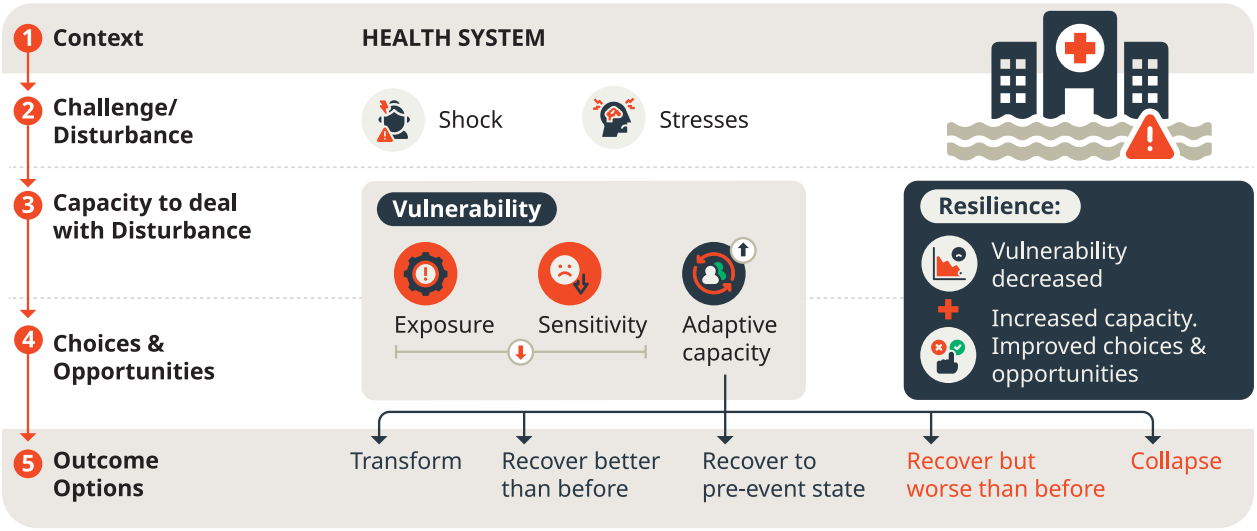
4 Hong Ngan - Duong Lieu / Tuoi Tre News. Hospitals in Vietnam's Quang Ninh ravaged by typhoon. September 9, 2024.
5 Thai hospitals report quake damage. Bangkok Post, November 17, 2023.
6 All-time high of 71 million people internally displaced worldwide. Internal Displacement Monitoring Centre, May 11, 2023.

WHO's definition of a climate-resilient health system

A climate-resilient health system can anticipate, respond to, cope with, recover from and adapt to climate-related shocks and stress, bringing sustained improvements in population health despite an unstable climate.

Healthcare systems play a dual role in the climate crisis, both contributing to and mitigating climate change. Governments and health agencies are increasingly adopting initiatives, such as the Agency for Healthcare Research and Quality's decarbonization primer, which provides tools to set goals and strategically reduce emissions.

Figure 2. Climate resilience in health care systems



Source: WHO operational framework for building climate resilience healthcare systems, 2015

The intersection of climate and health highlights the need for systems that both lower their environmental footprint and build resilience to protect populations from climate-related risks. Achieving this requires collaboration across sectors to integrate health and environmental considerations into policies and practices, paving the way for healthier and more sustainable health care systems.

Section 2
Scope and Purpose of this Document

Section 2
SCOPE AND PURPOSE OF THIS DOCUMENT

The purpose of this document is to share experience on how global vulnerability assessment tools have been adapted and applied for creating climate-resilient and sustainable health care facilities in Asia. Rather than serving as a step-by-step instructional manual, it showcases some of the key methods and frameworks that can be used to adapt global assessment tools to make them more contextualized and reflective of local realities.

We hope readers will draw inspiration from the real-world experiences presented and adapt these approaches to suit their specific contexts.

Key offerings of the document are:

Practical lessons and experiences from real-world case studies in Timor-Leste, Philippines, Thailand, and Vietnam on the customization of global tools for assessing the climate vulnerability of health care facilities.

A process and detailed framework for contextualizing global tools for assessing climate vulnerability. This framework serves as a template for adaptation that can be used by stakeholders in countries in Asia and throughout the Global South.

An overview of available WHO tools for assessing health care facility climate vulnerability.

Practical recommendations on designing climate-resilient and environmentally sustainable health care facilities.

A list of relevant tools, templates, and references that could be useful in the adaptation of tools and implementation of climate vulnerability assessments.

To ensure the methods and approaches remain dynamic and relevant, we plan to include additional case studies as we conduct more assessments in other countries. This will provide more experiences, further enriching the methods and insights offered in the guide.

Section 3
Overview of Global Assessment Tools for Climate Adaptability

Section 3
OVERVIEW OF GLOBAL ASSESSMENT TOOLS FOR CLIMATE ADAPTABILITY

3.1 Global Assessment Tools

In response to the widespread impact of climate change on health systems, WHO has developed five global tools for assessing climate vulnerability. The following tools are designed to help the health sector systematically and effectively address the growing challenges posed by climate change while also working to reduce its own carbon footprint:

1. ***Operational framework for building climate resilient and low carbon health systems, 2015*** – The goal of this framework is to enhance the climate resilience of health systems to protect and improve the health of local communities in the face of changing climate while optimizing the use of resources and implementing strategies to reduce greenhouse gas emissions. **Click here to explore the framework in detail.**
2. ***Checklists to assess vulnerabilities in health care facilities in the context of climate change, 2021*** – This document was designed as a complementary tool for use with the WHO Guidance for Climate Resilient and Environmentally Sustainable Health Care Facilities framework. The checklists can be used to assess and evaluate a health facility's levels of climate resilience. **Click here to learn more about the checklists.**
3. ***Guidance for climate resilient and environmentally sustainable health care facilities, 2020*** – This guidance document aims to enhance the capacity of health care facilities to protect and improve the health of their target communities in an unstable and changing climate. It focuses on supporting health care facilities to be environmentally sustainable by optimizing the use of resources and minimizing the release of waste into the environment. **Click here to learn more about the tool.**
4. ***Quality criteria for the evaluation of climate-informed early warning systems for infectious diseases, 2021*** – The objective of this tool is to outline key technical and operational criteria for the performance, application, implementation, and effectiveness of early warning systems for multiple infectious disease outbreaks. **Explore the document here.**
5. ***Hospital Safety Index evaluation forms, 2019 (second edition)*** – The Hospital Safety Index forms can be used to assess the safety and vulnerability of hospitals and to recommend actions to improve their safety and emergency preparedness. **Learn more about the tool here.**

3.2 WHO's Operational Framework

The Operational Framework for Building Climate Resilient and Low Carbon Health Systems' (2015) is often used and cited for assessing climate vulnerability in health care settings. For example, the World Bank's Climate Resilience Framework for Healthcare Facilities in Ghana was developed using WHO's 2015 framework. Tools for building climate resilience in Canada, the Philippines, Thailand, and Timor-Leste are also built on the same framework.

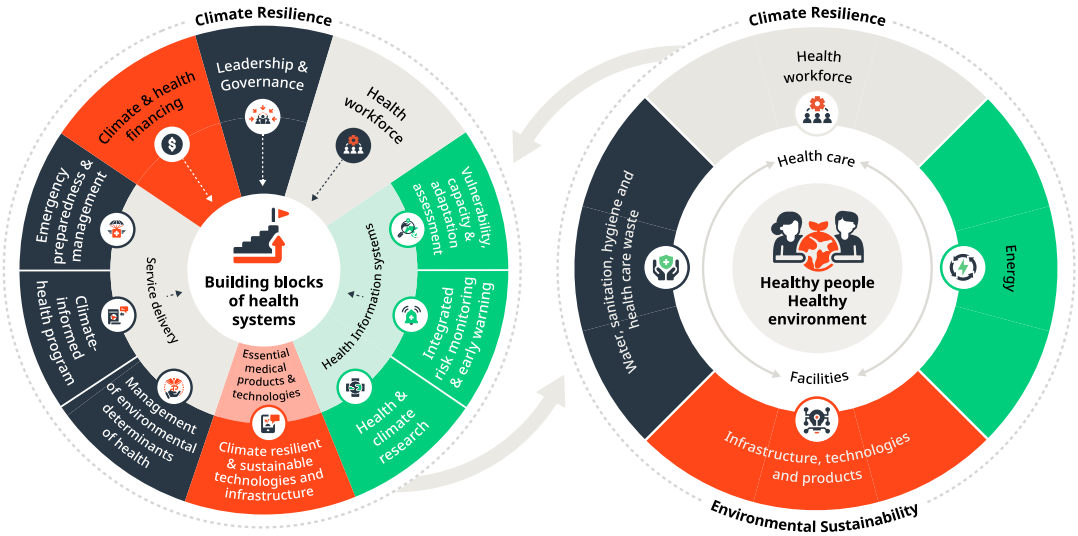
This operational framework defines 10 key components that are vital to making health systems climate resilient:

1. Climate-resilient and sustainable technologies and infrastructure
2. Management of environmental determinants of health
3. Climate-informed health program
4. Emergency preparedness and management
5. Climate and health financing
6. Leadership and governance
7. Health workforce
8. Vulnerability capacity and adaptation assessment
9. Integrated risk monitoring and early warning
10. Health and climate research

3.3 WHO Guidance

In 2020, WHO also published its *Guidance for Climate Resilient and Environmentally Sustainable Health Care Facilities* in 2020.[7] It provides tools for health professionals to assess resilience to climate threats and environmental sustainability, focusing on resource use (water, energy, procurement) and hazardous material release. The guidance also emphasizes the role of universal health coverage in improving care quality, service accessibility, and affordability by reducing facility costs.

Figure 3. Climate resilience and environmental sustainability in health care facilities

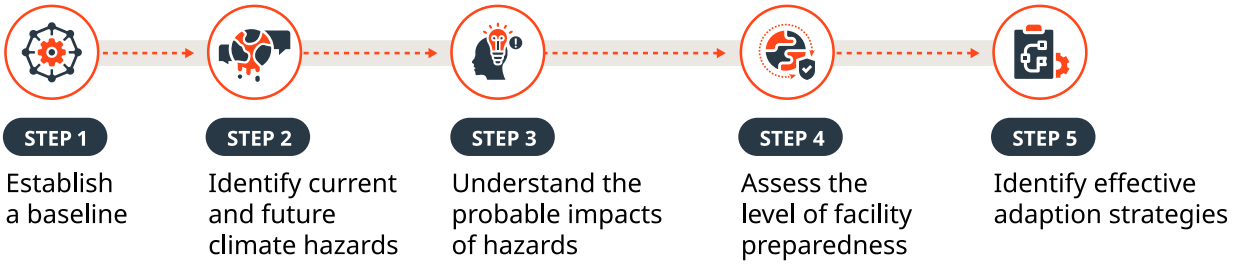


Source: WHO Guidance for Climate Resilient and Environmentally Sustainable Health Care Facilities, 2020

This guidance focuses on four key components: 1) Health workforce, 2) Water, sanitation, and waste management, 3) Energy, and 4) Infrastructure, technology, and products. It emphasizes training health professionals, ensuring safe water and waste management, promoting energy efficiency, and integrating climate-resilient infrastructure. It also outlines a vulnerability and adaptation assessment process, helping health care facilities identify climate hazards and prioritize adaptation measures to enhance resilience and sustainability.

7 Guidance for climate resilient and environmentally sustainable health care facilities. Geneva: WHO; 2020.

Figure 4. Assessment process with global WHO tools



Included are checklists for assessing the climate resilience and environmental sustainability of a given health care facility organized according to the four fundamental requirements discussed above.

Based on the indicators mentioned in the checklists, interventions are evaluated on each of the four requirements as low performance, medium performance, or high performance. These ratings can guide decision-makers to act on the aspects of health care facilities that are more vulnerable to the effects of climate change or address practices that are environmentally unsustainable.

Section 4
Localizing Global Tools

Section 4
LOCALIZING GLOBAL TOOLS

4.1 Need for Localizing the Global Tools

National governments and international agencies have developed climate vulnerability assessment tools for health care facilities, such as the five WHO tools, which provide guidelines and templates for assessing and improving resilience to climate-related shocks. While these tools offer overall guidance, they may not fully account for local contexts and knowledge, posing challenges in data collection and assessment accuracy. WHO recommends adapting these tools to local settings to ensure effective assessments.

Experience in Asia shows that localization is essential for relevance, leveraging local knowledge, and promoting a participatory approach. Involving communities in the process can improve data accuracy and facilitate more effective climate action. Additionally, orienting health facility managers before assessments enhances implementation, fostering trust and ownership.

To be effective, global tools should be customized for practicality and logistical feasibility, ensuring they align with local conditions and are focused on the specific climate hazards faced by health care facilities. This approach leads to more efficient resource use and targeted outcomes.

4.2 Case Studies

4.2.1 PHILIPPINES

Brief country background

The Philippines is an archipelagic country surrounded by coastal areas and hilly terrains. This geographical setting makes the country prone to natural calamities such as droughts, floods, cyclones, storms, earthquakes, and volcanic eruptions, exacerbating its vulnerability to the effects of climate change.

In 2022, the Philippines ranked 115 out of 181 countries in the Notre Dame–Global Adaptation Initiative (ND–GAIN) Index of vulnerability and readiness to adapt to climate change.[8] The recent World Risk Index 2024 ranked the Philippines at highest risk of natural disasters and as being the most susceptible to extreme weather events out of 193 countries.

One of the most visible effects of climate change has been on public health in the Philippines. For example, air pollution has exacerbated the risk factors for tuberculosis. Preventable diseases such as diarrhea, dengue, and malaria continue to increase mortality in the country. Although the Constitution of the Philippines recognizes the right to health as a fundamental right, the public health system struggles to cope with the intensifying climate crisis.

To build climate-resilient and environmentally sustainable health facilities in Philippines, the Green and Safe Health Facility Initiative (GSHFI) was initiated under the USAID's TB Innovations and Health System Strengthening Project (TBIHSS), in collaboration with the Department of Health's Health Facility Development Bureau (DOH-HFDB), the Department of Environment and Natural Resources (DENR), the Climate Change Commission (CCC) in the Philippines. FHI 360 Philippines and Health Care Without Harm Southeast Asia were responsible for technical guidance.[9]

8 GMA Integrated News. Philippines has the highest world risk index anew in 2024 report. GMA News Online, September 10, 2024.
9 Green and safe health facility initiative report. Health Care Without Harm Southeast Asia; 2023.

How was the project executed?

The project team adopted a consultative approach to developing the assessment tools. Technical support was provided to the selected facilities, and existing materials such as papers, articles, reviews, and policies were compiled. The team identified the *WHO Guidance for Climate-Resilient and Environmentally Sustainable Health Care* as the base framework and referred to the Green and Safe Health Facility Framework by the Department of Health to adapt to the local realities of the Philippines.

Phase I: Preliminary meetings and expectation setting

The project team conducted a series of internal consultations meetings to define the objectives of the assessment and understand the expectations of the various stakeholders. After an introductory meeting produced a shared understanding of program objectives, methodologies, and deliverables, a stakeholder planning meeting was held to finalize the overall project timeline and strategies.

Phase II: Climate and health training for health facilities

Four training modules were developed focusing on climate change awareness and its impact on health, particularly on lung health. The training program mainly integrated two components: 1) sustainability and climate, and 2) contextual scenarios relevant to the three levels (primary, secondary, and tertiary) of targeted health facilities. These trainings were designed to enable the participating health facility managers to identify the facilities' key requirements and were crucial in empowering health facilities to adopt sustainable practices.

Phase III: Data collection and validation

Different data collection tools were integrated into a single tool by compiling checklists from WHO, the DOH, and Healthcare Without Harm Southeast Asia and consolidated them into a single data collection tool. This consolidated tool was contextualized with information about local requirements while ensuring that the assessment addressed the four fundamental components of climate vulnerability assessment (1) health workforce; (2) water, sanitation, hygiene, and waste; (3) energy; and (4) infrastructure, technology, and sustainability). The information collected was then verified with the help of site assessment and document review.

Phase IV: Drafting of Green Viability Assessment (GVA) report

Based on the data collected and a review of previous assessments and training reports, the assessment team prepared a report that included the proposed activities and outcomes for selected hospitals and a final set of recommendations. A project evaluation was conducted to solicit feedback and close the project.

How were the tools localized?

WHO's Guidance for Climate-Resilient and Environmentally Sustainable Health Care Facilities was adapted to create the Philippine Health Facility Development Plan of 2020–2040. The DOH also customized the Green and Safe Health Facility Manual and Green Viability Assessment (GVA) tools to effectively facilitate the assessment of primary, secondary, and tertiary levels of health care facilities.

To adapt the global tools, the project team took the following steps:

1. **Literature review** – After reviewing the current policies, national laws, guidelines, and previous reports drafted by Health Care Without Harm, the team prepared an inception report that included a rough outline of the assessment tools and climate and health training modules.
2. **Integrated data collection instruments** – The data collection tools were based on relevant tools developed by Health Care Without Harm. The team consolidated the most important and applicable components of all these checklists into a single climate hazard checklist, making it more relevant and easier to understand.
3. **Data collection for contextualizing tool**s – The GSHFI team conducted field visits, key informant interviews (KII)s, and focus group discussions (FGDs) to collect data from the health facilities and other local stakeholders to guide the adaptation of the tools. Quantitative data tools such as surveys and checklists were also deployed to collect data.

Key takeaways from this assessment

1. Piloting the tools before implementation

The team highlighted the importance of piloting the tools before implementation to evaluate their effectiveness and suitability for local conditions. Piloting of tools provided the project team with a chance to see how the tool worked in practice and to identify any issues that might arise during implementation. Feedback from stakeholders during piloting can aid in refining and improving the tool.

2. Orientation of health care facility managers

To ensure the proactive participation of the health care facilities in the assessment, the team recommends properly sensitizing the facility managers before officially rolling out an assessment. Sensitization helps team members and stakeholders understand expectations and better communicate the objectives, process, and outcomes of such an exercise. It also provides an opportunity to delineate the roles and responsibilities of the stakeholders in the assessment, improving the overall process of implementation.

4.2.2 VIETNAM[10]

Brief country background

Vietnam's position in Southeast Asia makes it highly vulnerable to climate-related hazards and extreme weather conditions. The most common environmental disasters include flooding, droughts, and cyclones. The country's long coastline, low-lying areas, and high population density have further intensified the impact of climate change. About 70% of Vietnam's population lives in low-lying coastal areas, which puts them at a greater risk of economic and health issues.

10 This was a review study conducted by FHI 360 in collaboration with the University of Melbourne's climate CATCH Lab to support the Vietnam Health Environment Management Agency (VIHEMA) in developing standards and localized indicators for creating climate resilient and environmentally sustainable healthcare facilities

The climate vulnerability of Vietnam consistently ranks high in different climate vulnerability indices. The country was ranked 92nd out of 181 countries in the ND-GAIN Index in 2022[11] and 91st out of 191 countries in the INFORM Risk Index in 2019.[12]

Climate change has limited access to safe drinking water and sanitation for nearly half of Vietnam's population.[13] This shortage has accelerated the spread of infectious diseases such as dengue, malaria, cholera, and yellow fever, which are now more easily transmitted and active for longer durations. Climate-related effects have also exacerbated malnutrition and diarrhea. Rapid industrialization and increasing reliance on fossil fuels have heightened the risks of respiratory and cardiovascular diseases; unequal access to clean cooking fuels has further compounded these health concerns.

To address climate-induced health issues, the Government of Vietnam has introduced initiatives targeting the health effects of climate change and prioritizing environmental sustainability within health care. A key initiative is the Climate Change Response Action Plan for the health sector, which envisions a sustainable future by 2050. The Vietnam Health Environment Management Agency (VIHEMA) has been instrumental in establishing standards within hospital environment quality metrics, emphasizing waste management, air quality, and water, sanitation, and hygiene (WASH) practices. These standards enable regular assessments, promoting continuous improvement and adherence to environmental regulations.

The Strengthening Health System Readiness to Adapt to Climate Shocks and to Mitigate Health Care's Impact on Climate Change project, funded by the United Kingdom's Foreign, Commonwealth & Development Office, was launched in support of VIHEMA's efforts to develop standards and assess adherence. FHI 360 and the University of Melbourne's Climate CATCH Lab collaborated to provide knowledge support, conducting a review to inform the development of national standards and localized indicators for creating climate-resilient and environmentally sustainable health care facilities.

Note: The findings from Vietnam are based on an initial analysis conducted to develop indicators and do not represent a full assessment of health facilities. Key takeaways from other countries are derived from completed assessments. Once assessments are conducted in Vietnam, their findings will be included

How was the review conducted?

The project team aimed to enhance the resilience and adaptive capacity of Vietnam's health system by examining global guidelines, evidence, and case studies to develop relevant indicators for review. This review supported VIHEMA in establishing a hospital monitoring system within Vietnam, facilitating ongoing evaluation and improvement across health care facilities.

Phase I: Rapid literature review

The project team identified the relevant keywords and databases for a comprehensive analysis. Their primary focus was on hospital waste, air pollution, and WASH practices to evaluate the current state of hospital quality and the feasibility of implementing new standards. Researchers from the University of Melbourne reviewed a diverse range of sources, including both academic and relevant gray literature, to ensure a robust assessment of existing conditions and practices.

11 Notre Dame Global Adaptation Initiatives rankings, 2022.
12 World Bank Climate Change Knowledge Portal, No date.
13 Climate change: Viet Nam secures hospital water supplies for resilient future. World Health Organization; 2023.

Phase II: Data extraction

In the second phase, the data collected for the review were organized based on the elements outlined in the *WHO Guidance for Climate Resilient and Environmentally Sustainable Health Care Facilities (2020)*. This framework includes key areas such as health workforce, WASH management, energy, infrastructure, technology, and product management, enabling a structured approach to assessing climate resilience and sustainability in health care facilities.

Phase III: Guideline review

The team reviewed tools and guidelines developed by Vietnam's Ministry of Health as well as international agencies such as the WHO and Healthcare Without Harm. This step was aimed at aligning Vietnam's health sector practices with global standards for climate resilience and environmental sustainability.

Phase IV: Development of standards

The team analyzed existing frameworks to create a tool tailored for Vietnam; its implementation is ongoing. Three WHO guidelines and tools were integral to this development: *WHO's Checklist to Assess Vulnerabilities in Healthcare Facilities in the Context of Climate Change (2021)*, *Guidance for Climate Resilient and Environmentally Sustainable Healthcare Facilities (2020)*, and the Water and Sanitation for Health Facility Improvement Tool (2018). In addition, the International Organization for Standardization's *Environmental Management Systems (EMS)* framework was examined to incorporate comprehensive environmental management practices.

To identify domain-specific interventions, the team reviewed the following guidelines:

1. For Water, Sanitation, and Hygiene: WHO CRECHE-Facilities, Global Green and Healthy Hospitals (GGHH), and WASH-FIT (WHO and UNICEF) guidelines
2. For Waste Management: WASH FIT Healthcare Waste Management essential indicators (WHO and UNICEF, 2022)
3. For Infrastructure, Technologies, and Products: WHO and Health Care Without Harm guidelines

Specific frameworks for developing quality control criteria, such as the SusQI framework, Total Quality Management Framework, Lean Six Sigma, and Quality Function Deployment, were also studied in depth by the project team.

4.2.3 TIMOR-LESTE

Brief country background

A small island developing state (SIDS) in Southeast Asia,
Timor-Leste is highly vulnerable to natural hazards such as droughts, floods, landslides, soil erosion, and heavy rainfall. In the Second National Communication to the United Nations Framework Convention on Climate Change in 2020, Timor-Leste identified agriculture, water resources, forestry, and public health to be the sectors most vulnerable to climate change.[14] According to the Inform Risk Index 2019, the country ranked 66th out of 191 countries, indicating a high disaster risk level.

14 Second national communication to the United Nations Framework Convention on Climate Change. Secretary of State for Environment, Timor-Leste, November 2020.

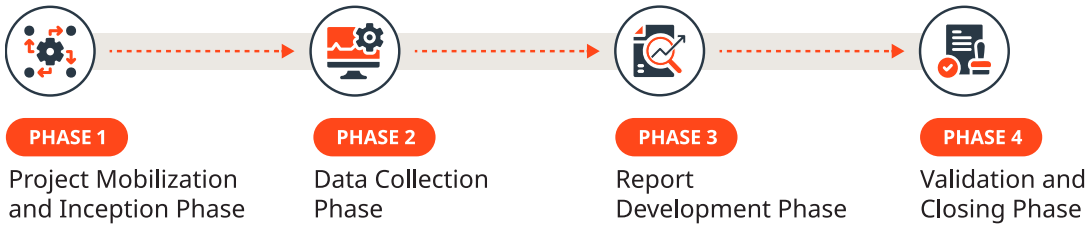
Over the years the country has made considerable progress in development. However, only 57% of the population have access to basic sanitation. A considerable percentage of the population suffers from high levels of poverty,[15] further exacerbating their vulnerability to the effects of climate change.

The IFRC Country Assessment Report highlighted that years of conflicts in Timor-Leste had a severe impact on the nation's infrastructure, including health care facilities. To strengthen climate resilience within the health sector, WHO launched a collaborative project with Health Care Without Harm Southeast Asia. This initiative supports Timor-Leste's Ministry of Health (MOH) in developing policies and strategies aimed at fostering climate-resilient and environmentally sustainable health care facilities across the country.

How was the project executed?

The project team in Timor-Leste implemented a consultative and collaborative approach to maximize guidance and input from WHO and the Ministry of Health (MOH). They employed a streamlined process to organize and coordinate activities, ensuring effective delivery of project outputs within the set timelines.

Figure 5. Project implementation process in Timor-Leste



Phase I: Project mobilization and inception

Initially, the team undertook a series of internal and stakeholder meetings with WHO and MOH. The purpose of these meetings was to consult on the approach and methodology and to outline the project management structure and execution plan. After the meetings, the team extensively reviewed relevant documents relevant to the adaptation process. Drawing on the insights gained from the literature and feedback from the WHO and the MOH, the team wrote an inception report outlining the approach and methodology for implementing the vulnerability assessment.

Phase II: Data collection

The data collection phase included the following steps:

1. **Selecting health care facilities** – Tertiary, secondary, and primary health care facilities were targeted for the project implementation. Customized checklists were created for each level of the facility to ensure the tools and checklists were fit for purpose and relevant.
2. **Data collection methods** – The team used a mixed-methods approach (quantitative and qualitative) to gather data on climate vulnerability and adaptive capacity. The team employed methods such as surveys, checklists, focus group discussions, key informant interviews, facility assessments, and site visits.

15 Climate risk profile, Timor-Leste. Asian Development Bank; 2021.

3. **Data processing and analysis** – A thematic analysis approach was adopted to analyze the data collected from field interviews and review the existing literature. This method facilitated the identification of key patterns, trends, and insights, leading to a more comprehensive understanding of the vulnerabilities and challenges confronting the health care system in light of increasing climate shocks.

Phase III: Report development phase

In the next phase, assessment reports were developed based on the collected data and the literature review. These reports are a synthesis of the findings, providing a comprehensive analysis of the health care system's vulnerabilities and responses to climate-related challenges.

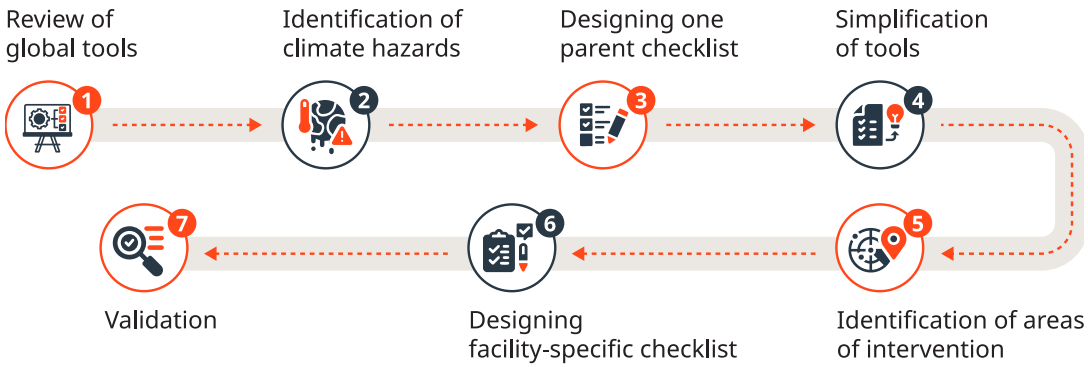
Phase IV: Validation and closing phase

The outcomes and recommendations from the assessment were compiled into reports and shared for further discussion and validation by experts from WHO and the Ministry of Health (MOH). This collaborative review aimed to refine the findings and ensure alignment with broader health and climate-resilience strategies.

How were the tools localized?

The government of Timor-Leste adapted the WHO Operational Framework for Building Climate-Resilient Health System (2023) and the WHO Guidance Document for Climate-Resilient and Environmentally Sustainable Healthcare Care Facilities (2021). Since these frameworks were broad and generic, the team developed tools tailored to the specific health contexts of Timor-Leste, drawing from the frameworks to ensure their relevance and applicability within the local settings.

Figure 6. Adaptation process in Timor-Leste



The process of adaptation included the following steps:

1. **Review of global tools** – The team started by thoroughly reviewing the original WHO frameworks and vulnerability assessment checklists to identify important components, categories, and questions from them.

2. **Identification of climate hazards** – To identify climate hazards—such as droughts, heat waves, floods, cyclones, and storms—in each selected district and for the targeted health care facilities, the team collected and reviewed relevant data and reports of climate shocks occurrences. The aim of this comprehensive analysis was to understand the specific risks faced by each facility within its local context.

3. **Design of one parent checklist** – After reviewing the WHO checklists and identifying relevant climate hazards, the team opted to integrate essential elements from the individual climate hazard checklists into a single comprehensive checklist. The resulting checklist streamlined the assessment process, making it simpler and less time-consuming, while ensuring efficiency in evaluating the vulnerability of health facilities to climate hazards.

4. **Simplification of tools** – After integrating the checklists, the team simplified their language, format, and structure to make them easier to read and use.

5. **Identification of areas of intervention** – The initial areas of intervention included access to clean and safe WASH; sustainable health care waste management; resilient and sustainable energy supply; access to health care services; availability of medical staff and medical supplies; communication and coordination among health care providers; and infrastructure resilience.

6. **Design of facility-specific checklists** – The project team began by assessing a tertiary-level hospital in Timor-Leste, which led to the creation of an initial checklist containing questions and themes specific to the needs of tertiary hospitals. Based on feedback and implementation experiences, this checklist was subsequently customized for use in assessing secondary and primary-level hospitals throughout the country.

7. **Validation** – Finally, the team consulted with officials from WHO and the MOH to validate the checklists for tertiary, secondary, and primary-level hospitals. This collaborative effort ensured that the checklists met the necessary standards and effectively addressed the specific needs at each hospital level.

Key takeaways from this assessment

1. Contextualization of WHO tools

Effective adaptation requires a comprehensive understanding of local contexts. The WHO vulnerability assessment frameworks often overlook specific local factors, highlighting the need for contextualization to ensure that assessments reflect local realities. Furthermore, these assessment tools are broad and detailed, making them non-targeted, sometimes irrelevant, and impractical.

In this case study, it is clear that the tailored checklists led to a more streamlined implementation of vulnerability assessments in health care facilities. The adaptation ensured that the needs and vulnerabilities of the facilities were accurately captured. In addition, using the contextualized tools proved easier and less time-consuming for both the project team and the health facility managers involved in the vulnerability assessment.

2. Encouraging wider stakeholder mobilization and an inclusive approach

The adaptation process can have a significantly greater impact when a broader range of stakeholders are mobilized and an inclusive approach is adopted. In Timor-Leste, the engagement of WHO and the Ministry of Health (MOH) was crucial for providing feedback and input throughout the project. The project team recognized that expanding engagement to include various stakeholders—such as civil society organizations, pollution control officials, engineers, public health and climate change researchers, and activists—could enhance the overall effectiveness and productivity of the initiative.

3. Orientation of facility managers and health care professionals

The project team recognized that low awareness levels among facility managers and health care professionals could hinder the assessment process. To address this limitation, a rapid orientation session is recommended in the initial phase to establish the context for the vulnerability assessment. The purpose of this session is to explain the assessment's objectives, relevance, processes, and expected outcomes. By sensitizing managers and professionals, the team can foster more proactive engagement and coordination throughout the assessment process, ultimately enhancing the outcomes and effectiveness of the exercise.

4.2.4 THAILAND

Brief country background

The Global Climate Risk Index 2021 ranks Thailand as the 9th most affected country regarding climate effects on human health and economic losses. The country is highly vulnerable due to its increasing exposure to natural hazards such as heavy rainfall, floods, droughts, and sea level rise. Increasing temperatures are also causing a rise in heat-related conditions such as heat stroke and exhaustion.

The 2021 Climate Risk Country Profile, published by the Asian Development Bank and the World Bank, shows temperature and annual precipitation increases across Thailand. The combination of rising seas, sinking land, and potential cyclone-induced storm surge due to climate change places the country in a precarious position.

The health care sector is anticipated to play a crucial role in mitigating the effects of climate change on human health in Thailand. For example, by 2035–2044, the number of people affected by an extreme river flood could grow by over 2 million during this period, increasing the risk of deaths and outbreaks of water- and vector-borne diseases and other flood-related infections.[16]

Therefore, building resilient and sustainable health care systems is the need of the hour. Thailand needs a robust health care system to cater to the diverse medical needs of the communities in the face of changing climate. Health care facilities are increasingly vulnerable to climate shocks while also making significant contributions to carbon emissions due to their high energy use and resource-intensive operations. Strengthening the climate resilience and environmental sustainability of health care services is essential to reducing their ecological impact and protecting public health.

Thailand has already taken steps in this direction. In 2011, the country's Ministry of Public Health adopted some "green and clean" hospital practices aimed at reducing greenhouse gas emissions and achieving sustainable sanitation. However, the country had no specific vulnerability assessment tools for health care facilities. Therefore, Thailand's government undertook the initiative of developing a green viability and climate vulnerability assessment framework for health care facilities by studying different composite indicators on disaster risk reduction, mitigation, and environmental sustainability measures. These assessment tools focus on identifying and addressing potential risks and challenges to delivering effective health care during emergencies.

16 Reliefweb. Climate risk country profile – Thailand. 2020 Aug 11 [cited 2024 Nov 21]. Available from: https://reliefweb.int/report/thailand/climate-risk-country-profile-thailand.

How was the project executed?

The development of assessment tools to evaluate the green viability and climate vulnerability of health care facilities in Thailand involved three key steps:

Phase I: Formative work – Literature review and brainstorming workshops

The project team conducted a comprehensive review of the existing literature on green health care, sustainable health care, and climate-resilient health care to guide the development of a set of tools to assess the green viability and climate vulnerability of health care facilities in Thailand. A brainstorming workshop was then held to further refine these tools and gather input from multiple stakeholders.

Phase II: Data collection

The team visited health facilities to collect data. Face-to-face interviews, focus group discussions, and Delphi expert panels were undertaken to gather information from health facility directors, managers, and emergency coordinators. The interviews were structured and consisted of questions from the assessment tool. One tertiary, one secondary, and two primary health care facilities were selected for assessment based on the findings from the interviews.

Phase III: Dissemination of the findings

A post-assessment conference involving multiple stakeholders was held on September 22, 2023. Its purpose was to disseminate the findings of the assessment and to encourage Thai policymakers and government officials, international donor agencies, and international nonprofit organizations to consider using the final assessment tool and proposed policy recommendations.

How were the tools localized?

The team built the tools using the WHO Guidance for Climate Resilient and Environmentally Sustainable Health Care Facilities, U.S Department of Health and Human Services Sustainable and Climate Resilient Health Care Facilities Initiative, and the recommendations from the fifth Intergovernmental Panel on Climate Change (IPCC) Assessment Report.

The process of adaptation included the following steps:

1. **Literature review** – The team began by reviewing theoretical frameworks and empirical studies on green health care, sustainable health care, and climate-resilient health care. They synthesized these insights to develop a comprehensive conceptual framework and a set of assessment tools specifically designed to evaluate the green viability and climate vulnerability of health care facilities in Thailand.

2. **Brainstorming workshop** – The workshop brought together officials from the Ministry of Public Health and the Ministry of Interior, health facility directors, and representatives from partner international organizations to review and refine the proposed assessment tools. During the meeting, key stakeholders provided valuable input, feedback, and recommendations, which were integrated to create a single assessment tool.

3. **Development of the indicators and checklists** – Most indicators were adopted from the U.S. Department of Health and Human Services' Sustainable and Climate Resilient Health Care Facilities Initiative, which provided a strong foundation for assessing coping capacity. While the WHO framework contains a wide range of

components and indicators, only those specifically relevant to Thailand were incorporated. For adaptive capacity indicators, the project team drew on local knowledge and experiences, ensuring the assessment tool was well-suited to Thailand's unique health care context.

4. **Recommendations from IPCC Fifth Assessment Report (AR5)** – A representative from the Department of Climate Change suggested integrating recommendations from the IPCC Fifth Assessment Report, which offered relevant insights for the project's focus areas. These recommendations include leveraging a geographical information system (GIS) for hazard monitoring, securing natural disaster insurance, and encouraging a localized, participatory approach to climate change mitigation and adaptation.

5. **Revision of the assessment tool** – The assessment tool was revised to integrate the feedback and insights received from the participants in the brainstorming workshop.

6. **Follow-up interviews** – The team conducted follow-up interviews with a range of officials and health care facility directors across Thailand to determine the suitability of the revised assessment tools for health care facilities in Thailand.

Key takeaways from this assessment

1. Contextualizing WHO tools

This case study underscores the critical role of reviews of climate literature in adaptation of vulnerability assessment tools. Integrating global assessment tools, such as IPCC AR5, the Hyogo Framework, and the WHO framework, provides a broader range of options, allowing the adaptation of assessment tools to better reflect regional or national contexts. It is therefore essential for assessment teams to continuously monitor and review climate literature, establishing mechanisms for incorporate such insights into localized versions of assessment tools that address specific local challenges and needs.

2. Prioritizing the needs of primary and community health care centers

In the adaptation process, the project team recommended prioritizing primary and community health care centers because these facilities are often the most accessible to the general population, especially vulnerable groups such as seniors, children, and individuals with limited mobility. These centers tend to be more susceptible to climate shocks yet serve as the first line of defense against climate change and natural disasters. Therefore, vulnerability assessment tools should be tailored to address the unique needs of primary and community health care facilities, enhancing their climate resilience and environmental sustainability.

3. Encouraging local knowledge and experience for adaptive capacity

In terms of climate change adaptation, the project team emphasized that mainstream international standards may not always align with local regulations and practices related to adaptive capacities. Instead, they recommended engaging local knowledge systems, citizens, and other stakeholders to design adaptive capacity indicators because they groups are better equipped to understand specific climate risks, available resources, and regulatory frameworks. This approach ensures the development of tools that are more contextually relevant and tailored to local realities, promoting more effective climate adaptation strategies.

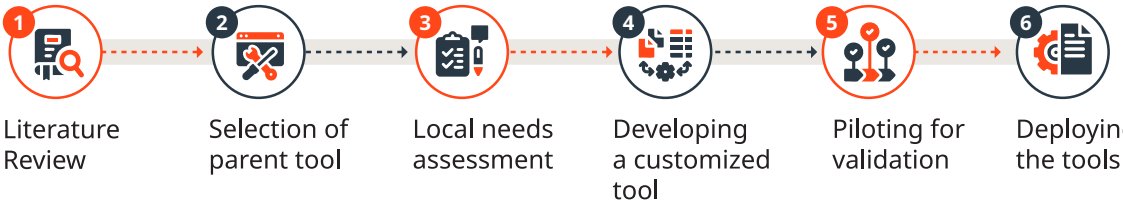
Section 5
Recommendations

Section 5
RECOMMENDATIONS

These recommendations outline steps for adapting global tools to meet local needs, helping create climate-resilient and eco-friendly health care facilities.

5.1 Process for Implementing Vulnerability Assessment

Step-by-Step Guide for Adaptation of Global Tools



1. LITERATURE REVIEW

The first essential step in any vulnerability assessment project is a comprehensive literature review. This review should focus on gathering existing resources related to building climate-resilient and sustainable health care facilities, including national policies, regulatory frameworks, assessment standards, reports from independent organizations, and global toolkits such as the WHO Operational Framework for Climate-Resilient, Low-Carbon Health Systems.

A literature review provides a clearer understanding of climate resilience approaches at both global and regional levels and identifies areas where tools may need localization. Researchers should also develop a method for documenting key findings from the literature. Alternatives such as a scoping study or primary background research can also be considered to identify relevant information without undertaking a full literature review.

The project team should go beyond tools and direct literature on climate vulnerability assessments to conduct an in-depth review of additional resources on climate science and policy, such as IPCC reports and Conference of the Parties (COP) climate summit briefs. These sources offer valuable insights into climate change and its effects on the health sector.

2. SELECTION OF A PARENT TOOL

The project team is advised to select an existing tool as a foundation. This approach offers a ready-made template that can be modified based on local inputs and feedback received during the process, saving time and effort compared to creating a tool from scratch. The approach also minimizes technical errors because established tools have already been widely applied. However, it is essential to adapt the chosen tool to the local context (see section 5.2).

3. LOCAL NEEDS ASSESSMENT

This step is strongly recommended before tool adaptation. Conducting a local needs assessment is essential for understanding the specific social, cultural, and political context of the area where the vulnerability assessment will take place. A consultative approach involving local leaders, municipal

bodies, health departments, facility managers, and community members will help the team identify challenges and vulnerabilities unique to the region. Combining secondary data can provide insights into trends in climate hazards, health events, policy actions, and more. Findings from this assessment will guide the project team in tailoring the tool to meet local needs and stakeholder expectations.

4. DEVELOPING A CUSTOMIZED TOOL

The first three steps will equip the project team with a solid understanding of local realities and climate vulnerabilities. With this foundation, the team can begin customizing the selected parent tool based on insights from the local needs assessment and literature review. Adjustments to the tool may involve its structure, flow, target audience, language, indicators, and outcomes. The primary goal is to develop checklists that effectively capture relevant climate hazards and associated risks for health care facilities. The checklists and tools should also be user-friendly—for example, avoiding unnecessary length and using accessible language for health care facility managers.

5. PILOTING FOR VALIDATION

The next step involves piloting the designed tools at selected health care facilities to evaluate their effectiveness during implementation. Piloting provides an opportunity for stakeholders to give constructive feedback on how well the tools align with the local context and to address specific vulnerabilities. Revisions based on this feedback help ensure that an assessment tool is user-friendly, relevant, and suitable for practical use.

For example, in Timor Leste, the Project Team made changes to the checklist based on the feedback provided by the local stakeholders such as hospital facility managers, health officials, researchers etc. After incorporating the feedback, the final version of the checklist was rolled out for collecting data.

6. DEPLOYING THE TOOLS

A phased rollout of assessment tools across the identified health care facilities is recommended for successful deployment. A basic sensitization on climate vulnerability assessment should be conducted before the tools are used for data collection. In addition, a monitoring and evaluation system should be established to ensure the tool is effectively integrated and provides valuable insights from the operations of the health care facilities.

However, it is important to note that this process is not linear, and there is ample room for constant back and forth until the tool is ready and reflects the expectations of all the stakeholders.

5.2 Method for Adapting Tools to Conduct Vulnerability Assessment

1. EXPECTATION SETTING AND BACKGROUND MEETING

Holding a meeting with relevant stakeholders at the inception stage will establish a strong foundation for the project, covering its background, implementation process, and expected outcomes. This step is crucial for clarifying the objectives of building climate-resilient and environmentally sustainable health care facilities and understanding the role of each stakeholder.

To ensure a productive meeting, the research team should begin by conceptualizing the agenda and identifying the stakeholders to be invited. The meeting should focus on gaining an understanding of the positions and expectations of the participants. Any conflicting views should be addressed and negotiated early on.

The team should also define the roles each stakeholder will play during the project and establish a communication framework to avoid confusion. Ultimately, these discussions will inform the design and execution of the project, ensuring alignment with stakeholder expectations and the desired outcomes (**Refer Annexure 1**).

2. IDENTIFICATION OF SITES

Identifying the health care facilities to be included in the initiative is a crucial step. This selection should be based on the vulnerability, exposure, and adaptability capacities of each facility, prioritizing those with lower levels of resilience. Before organizing site visits, the project team should conduct pre-assessment research to gather key information such as staffing levels, types and modes of service delivery, geographical setting, level of care, demographics served, existing environmental health systems, and other relevant data.

A baseline should be established using this information to assess resource consumption and pinpoint areas in need of intervention. Local health agencies should be consulted before finalizing the list of health care facilities for further research.

3. BASIC ORIENTATION BRIEFING OF THE HEALTH CARE FACILITY

Organizing orientation sessions for the staff of health care facilities involved in the assessments is highly recommended because they help set the context for the vulnerability assessment process. The assessment involves multiple phases, and low awareness or poor engagement among facility managers can have a negative impact on the process. Sensitization sessions can ensure proactive participation by building trust and providing clarity on expected outcomes. These sessions also highlight the benefits of climate vulnerability assessments, not only for the health care facility but also for the community it serves (**Refer Annexure 2**).

4. INCLUSIVE AND PARTICIPATORY DATA COLLECTION

It is essential that local communities are consulted during the data collection process. Their insights and experiences can help the project team identify key issues and may significantly affect the overall outcome of the assessment. This critical role of community participation highlights the importance of local factors and conditions in shaping the broader understanding of climate change and its effects on health care facilities in the region. Focus group discussions, in-depth interviews, and community surveys are effective methods for gathering data from local communities. In addition, having a volunteer or consultant from the community can greatly facilitate this process (**Refer Annexure 3**).

5. DATA ANALYSIS AND REPORT WRITING

At this stage, data entry, review of the information, thematic arrangement, and coding are essential steps. Technical support is recommended to minimize inconsistencies, errors, duplication, or invalidity in the data. Based on the processed data, the team should write a report with clear findings and recommendations. Before the report is finalized, a draft version should be shared with relevant stakeholders for their feedback. After incorporating that feedback, the team should prepare the final version of the report should be prepared for dissemination and use in advocacy.

6. DISSEMINATION OF FINDINGS AND STAKEHOLDER MEETING

Finally, a dissemination meeting should be organized to launch the report and discuss its findings and recommendations. All relevant stakeholders should be present to review and engage with the outcomes. A clear course of action should be developed for each stakeholder,

along with consensus on an implementation plan. This step will not only amplify the impact of the project but also build confidence in the ability to conduct more assessments across the region, strengthening the resilience and sustainability of health care facilities.

5.3 Key Learnings for the Stakeholders

As the process of adapting tools involves multiple stakeholders, coordination and consultation are essential at various stages of the adaptation of vulnerability assessment tools. In this section, we highlight specific recommendations for three key stakeholders: the project team, health care facility staff, and government agency representatives.

1. RESEARCHERS AND PROJECT TEAM

From planning and conceptualizing the project to its implementation, the project team is at the forefront of the adaptation process. It is recommended that the team interact with local communities to develop a more nuanced and contextualized understanding of the assessment process. A robust and inclusive methodology for data collection can play a critical role in the outcome of the project.

2. HEALTH CARE FACILITY STAFF

Health care facility staff are encouraged to recognize the importance and benefits of vulnerability assessments and take a proactive role, not only in participation but also in providing relevant data to evaluate the resilience of the facility. They should also aim to mainstream the involvement of patients and staff, ensuring they feel engaged and active in the process. Their experiences can contribute valuable insights to shape the climate resilience and sustainability roadmap for their health care facilities.

3. GOVERNMENT AGENCIES SUCH AS PUBLIC HEALTH MINISTRIES

Government agency representatives are encouraged to play a key role in bringing together relevant stakeholders and ensuring that all perspectives are considered and interventions are tailored to the local context. They should also review the policy and regulatory environments related to climate and health, exploring how these environments can support making the health care sector more resilient and sustainable. In addition, government agency representatives must ensure that the insights gained from such assessments are effectively implemented based on the evidence.

There is no doubt that the Vulnerability Assessment Tool remains an important method to identify the threats and vulnerabilities that healthcare facilities face due to climate change. However, this is just one of the many means required to make them resilient and sustainable. It is critical for the government and policymakers to acknowledge the need to push for wider systemic reforms along with conducting vulnerability assessments. These assessments alone cannot achieve much for healthcare facilities unless complemented by policy reforms, institutional-level interventions, and commitments by leaders.

ANNEXES

Annex 1
Tentative outline for designing basic orientation session for the health care facilities

» Introduction to project team

» Overview of **WHO Framework for Climate-Resilient and Environmentally Sustainable Health Care Facilities**

  • Figure 1, Figure 3, and Figure 4

» Overview of **WHO Checklists to Assess Vulnerabilities**

» Why understanding vulnerability is key to building facility resilience

» Outline of the four components of checklist i.e. health workforce, WASH, energy, infrastructure

» Go through a sample checklist

» Project execution process and timeline

» Overview of the country's health systems landscape and selected health facilities

» Discuss the project methodology: types of data collection methods (e.g. KII, FGD, Checklist); process for developing and finalizing data collection instruments; data storage and processing

» Review any proposed adapted checklist, tools, etc.

» Questions/Suggestions

Annex 2

Sample Agenda for Facility Visit – Basic orientation and Data Collection Process

- Introduction and opening messages (10 mins)
- Overview of the project and purpose of the visit and discussion (20 mins)
- Vulnerability checklist completion (30-45 mins)
- Key informant interviews with facility staff (30-45 mins)
- Site assessment, walk through in the facility (45-60 mins)
- Wrap up of discussion and next steps (10 mins)

Annex 3
Sample Data Collection Tools – FGD and KII

Focus Group Discussion (FGD) Questions

Target Respondents: WHO and MOH representatives

Description: A method to gather, in a more free-flowing manner, in-depth information on ideas and perceptions of a group of individuals (maximum of 10) from the WHO and MOH who are involved in climate and health V&A assessments, adaptation planning, climate-smart and sustainable healthcare

Core Questions: policy, implementation, priorities and resources and capacities

List of Questions:

1. What are the local existing policies supporting greening and building resilience within healthcare in Timor Leste?
2. What are the identified policy gaps, and how do you plan to address them?
3. On the national level, what are the challenges in implementing health programs that you face?
   a) infrastructure,
   b) human capital,
   c) financial budget, and
   d) communication and awareness-raising? How were you able to address these?
4. Who are the stakeholders involved in the development and implementation of your program/ policies?
5. How do you plan to involve other stakeholders who are crucial to the implementation but are not yet involved?
6. Does the MOH/WHO have a mechanism in place to monitor and evaluate the results and impacts of the policies/ projects and/or programs concerning greening and resilience building in the facility?
7. If yes, what are the mechanisms in place?
8. What are the long term vision and current priorities of the Ministry of Health?
9. How do you plan to achieve this?
10. What would be the role of external actors such as ASEAN, and other multilateral institutions when it comes to supporting/ enforcing the greening and climate-smart initiatives of the healthcare system in Timor Leste?

Key Informant Interview (KII) Questions

Target Respondents: Representatives from target hospitals and health facilities who are involved in sustainability, climate mitigation, and resilience initiatives

Description: An in-depth, one-on-one method of data gathering with guide questions to help us gather first-hand knowledge and experience as well as suggestions and recommendations, to be done during the site visits

Assumptions: Verifying information from the checklist survey.

Core Questions: policy, implementation, priorities and resources and capacities

Notes: Questions that will generate easy to analyze responses (yes, no). Include follow up questions to elaborate

List of Questions:

1. Name
2. Hospital
3. Gender
4. Position in the Hospital
5. What are your duties and responsibilities in the Hospital?
6. Does your hospital have an existing greening and disaster preparedness plan? (Yes, No, Maybe)
7. Have you conducted climate vulnerability assessment before? (Yes, No, Maybe)
8. If yes, what were the key findings and recommendations? (Short Answer)
9. Do you think you have enough employees at the hospital/center/ facility? (Yes, No, Maybe)
10. Do you currently have a Disaster Risk Reduction Management Plan? (Yes, No, Maybe)
11. Do you have an education program relating to DRR, climate change, and the importance of greening or sustainability in your facility? (Yes, No, Maybe)
12. Do you think you have the capacity to safely manage water, waste and chemicals and avoid potential risks to health workers? (Yes, No, Maybe)
13. If not, what do you think your hospital should do or prioritize to address this problem?
14. Does your facility implement energy efficiency regulations and are considering climate variability on its framework? (Yes, No, Maybe)
15. Does your facility plan on retrofitting obsolete and inefficient equipment and areas in the facility? (Yes, No, Maybe)
16. If not, what are the hindrances in doing so? (Short Answer)
17. Does your hospital have a monitoring mechanism used to measure the impacts of your climate related work and sustainability projects? (Yes, No, Maybe)
18. In your opinion, how can the hospital effectively engage the community members and local government to address climate related risks and promote sustainability? (Short Answer)
19. What type of on-going partnership or collaborations have hospitals in the area formed to address climate-related risks and sustainability? (Short Answer)
20. In your opinion how can the hospital ensure that climate resilience and sustainability are part of key organizational priorities? (Short Answer)

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