Status of the Development of Health National Adaptation Plan for Climate Change in South-East Asia

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Acronyms

AMC	Ahmedabad municipal corporation
CCHPU	climate change and health promotion unit
COP	Conference of Parties
DFID	Department of International Aid, UK
GCF	Green Climate Fund
GEF	global environment facility
HNAP	health national adaptation plan for climate change
IEC	information, education and communication
IEHK	interagency emergency health kits
INC	initial national communication
LDC	least developed countries
LDCF	least developed countries fund
NAPA	national adaptation plan of action
NAP	national adaptation plan for climate change
NAPCC	national action plan on climate change
NEHAP	national environment and health action plan
MoHFW	Ministry of Health and Family Welfare
MSTCCC	multi-sectoral technical committee on climate change
SDG	sustainable development goals
SEA	South-East Asia
UNFCCC	United Nations Framework Convention on Climate Change
VAA	vulnerability and adaptation Assessment

Summary

To protect health from climate change, countries should first complete a national health vulnerability assessment or health VAA. The assessment helps to assess which populations are most vulnerable to different kinds of health effects, and also to identify specific interventions to address the weaknesses in the systems.

All countries in the South-East Asia Region are committed to implement the 2010 Regional Strategy to Protect Health from Climate Change. This strategy ensures an effective integration of health-determining elements into national planning and encourages countries to use the Health National Adaptation Process or HNAP to connect with national initiatives oriented towards climate change adaptation. It also ensures that, within the scope of the National climate change Adaptation Plans or NAPs, relevant non-health sectors also plan for the reduction of climate threats that adversely affect health. NAP, health VAA and HNAPs are detailed in this report.

Progress in planning for the protection of human health from climate change is presented for nine out of the eleven countries in the South-East Asia Region. Progress has been delayed because development of the required planning instruments was not straightforward. Indeed, the more holistic NAP concept originated in 2011 at Conference of Parties (COP) 17 – 10 years after the first national adaptation programmes of action or NAPAs had been launched. This is one reason why some countries in the SEA Region have not yet developed their NAPs. In addition to this delay, conventionally most, if not all, action related to climate change has been under the responsibility of the environment sector, with health only peripherally involved. As a result, so far, only three countries out of nine have effectively developed a national health VAA and carried out their HNAP. All other SEA Region countries have initiated if not already completed several of the seven activities needed to complete a health VAA.

Finally, this status report presents an overview of the activities that the nine SEA Region countries plan to complete to further mature their national HNAP in 2017, indicating specific recommendations and additional tools towards that end.

1. Rationale for developing health national adaptation plans for climate change

Environmental and social changes occurring in the last 50 years as a result of human development have resulted in pushing or distorting Earth's great natural global systems beyond boundaries considered being safe for continued human social and biologic well-being.[1] As a result, the current geologic epoch, now called the Anthropocene,[2] is seeing the alteration of major components of the Earth's system due to chemical contamination, biodiversity loss, deforestation and soil erosion, freshwater depletion, air pollution, ocean acidification and global climate change. These global changes, which also include the impact of population growth and consumerism – two factors that are closely related to climate change – pose fundamental threats to human well-being and health.

Strong evidence that the Earth's climate is changing rapidly indicates that due to the accumulation of greenhouse gases in the higher atmosphere, global warming is occurring.[3] Until mid-century, increasing temperatures, changes in precipitation patterns, seal level rise and extreme events are expected to exacerbate a range of health risks, severely undermining human health. Yet, much of the potential adverse health impact from climate change can be prevented. Decision-makers from around the world have recognized this phenomenon and are presently engaged in strengthening key health system functions to abridge climate threats by improving the management of climate-sensitive health outcomes.

[1] Anthony J. McMichael, 2012. http://www.nejm.org/doi/pdf/10.1056/nejmra1109341. **[Please have IMD unit verify all references.]**

[2] The Anthropocene defines Earth's most recent geologic time period as being human-influenced, or anthropogenic, based on overwhelming global evidence that atmospheric, geologic, hydrologic, biospheric and other earth system processes are now altered by humans. http://www.anthropocene.info/

[3] IPCC, 2014. "Human influence on the climate system is clear, and recent anthropogenic emissions of greenhouse gases are the highest in history. Recent climate changes have had widespread impacts on human and natural systems." http://www.ipcc.ch/pdf/assessment-report/ar5/syr/AR5_SYR_FINAL_SPM.pdf

In 2008, the 193 countries that constitute the World Health Assembly committed to strengthen action to protect health from climate change, and requested WHO to provide support in planning and implementing mitigation and adaptation measures. [4] The critical first step towards protecting people's health from climate change is to carry out an assessment that can allow the health sector to evaluate the climate health risks for current and for future generations. This process, termed health vulnerability assessment or health VAA, helps to assess which populations are most vulnerable to different kinds of health effects, and also to identify specific interventions to address the weaknesses in the systems. The results of the health VAA guide policy-makers in developing policies, strategies and budget programmes to prevent and respond to climate change[5] inside the broader framework of a national mitigation and adaptation plan.

1.1 National adaptation plans for climate change or NAP

At COP 17, seventeenth session of the Conference of the Parties of the United Nations Framework Convention on Climate Change (UNFCCC), held in South Africa in 2010, the Parties broadly acknowledged that national adaptation plans (NAP) can enable all developing and least developed countries (LDCs)[6] assess their vulnerabilities and climate change risks to mainstream their adaptation strategies. COP 17 also recognized that climate change risks magnify development challenges for LDCs, and recognized the need to address adaptation in the broader context of sustainable development planning.

It is important to clarify that while the national adaptation programmes of action (NAPAs) promoted more than 10 years ago were designed to produce one national adaptation programme of action, the NAP process is designed to create a comprehensive national system integrating climate change adaptation into national planning, and produce NAPs on an ongoing basis.[7]

[4] http://www.who.int/globalchange/A61_R19_en.pdf?ua=1

[5] http://www.euro.who.int/__data/assets/pdf_file/0009/91098/E81923.pdf

[6] The least developed countries (LDCs) is a list of the countries that, according to the United Nations, exhibit the lowest indicators of socioeconomic development, with the lowest Human Development Index ratings of all countries in the world.

[7] http://unfccc.int/files/adaptation/cancun_adaptation_framework/national_adaptation_plans/application/pdf/naptech guidelines_eng_low_res.pdf

The two main objectives of the NAP process are to reduce vulnerability to the impacts of climate change by building adaptive capacity and resilience; and to facilitate the integration of climate change adaptation into policies, development planning processes and strategies with programmes and activities, incorporating the needs of all relevant sectors at the different levels.[8]

The NAP process was thus established at COP 18 under the 2012 Cancun Adaptation Framework[9] as a way to facilitate effective climate change adaptation planning in least developed countries (LDCs) and other developing countries. This framework enables countries to formulate one NAP as a means of identifying medium- and long-term adaptation needs as well as implementing strategies and programmes to address those needs.[10]

The NAP process is built around four basic elements:

(1) **Groundwork:** Establish institutional arrangements to launch the process, taking stock of available information on climate change impacts, vulnerability and adaptation, and assessing gaps.

(2) **Preparatory elements:** Analyse current climate and future climate change scenarios and vulnerabilities, and identify adaptation options. It also includes appraising adaptation options with the aim to mainstream climate change adaptation into national and subnational development and sectoral planning.

(3) **Implementation strategies:** Prioritize climate change adaptation in national planning and enhance the needed capacity for planning and implementation.

(4) **Monitoring and review:** Report monitoring and review of the NAP process and its effectiveness in reducing climate change threats.

The NAP process was again reinforced at the UNFCCC COP 21 held in France in 2015, with the Paris Agreement recommending that "Each Party shall, as appropriate, engage in adaptation planning processes and the

[8] https://unfccc.int/files/adaptation/cancun_adaptation_framework/national_adaptation_plans/application/pdf/decision_5_cp_17.pdf

[9] http://unfccc.int/resource/docs/2010/cop16/eng/07a01.pdf#page=4

[10] UNFCCC, 2011. National adaptation plans. A brief overview https://unfccc.int/files/adaptation/application/pdf/nap_overview.pdf

implementation of actions, by formulating and implementing national adaptation plans."[11] At the COP 22 held in Marrakesh in 2016, Parties decided that the final deadline to submit the NAPs would be set for 4 October 2017.[12]

Of particular significance is the request from COP 21 that "Parties should, when taking action to address climate change, respect, promote and consider the right to health."[13] The ultimate goal of the right to health is to achieve that all people live healthy lives in healthy communities.[14] To reach this goal in the context of protecting population health from climate change, it is of critical importance that the health sector actively participates to be fully and adequately represented in the NAP process.

Having the health sector engaged in adaptation planning will allow for critical actions to protect population health by refining its own policies and programmes. By engaging with the NAP process, the health sector will also enable the set-up of critical mechanisms to avoid that adaptation measures undertaken by non-health sectors inadvertently result in or contribute to adverse health impacts. Through cross-sectoral coordination and cooperation, the health sector will maximize synergies and promote health co-benefits across all the health-determining sectors, such as environment, energy, agriculture, housing and water.

The health sector's engagement in the NAP process will support achieving the targets of the 11 health-related Sustainable Development Goals (SDGs). Indeed, besides the nine targets of SDG 3 ("Ensure healthy lives and promote well-being for all at all ages"), risks with well-established

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[11] *The Paris Agreement came into force on 4 November 2016 and has been ratified by 115 countries including Bangladesh, DPR Korea, Indonesia, India, Maldives, Nepal, Sri Lanka and Thailand from the South-East Asia Region.* *http://unfccc.int/paris_agreement/items/9444.php*

[12] UNFCCC requests Parties "to continue to provide information on progress made towards the achievement of the objectives of the process to formulate and implement national adaptation plans and on experience, best practices, lessons learned, gaps and needs, and support provided and received in the process to formulate and implement national adaptation plans." See at: https://unfccc.int/files/meetings/marrakech_nov_2016/application/pdf/auv_cop22_i3b_national_adaptation_plans.pdf.

[13] *http://unfccc.int/files/essential_background/convention/application/pdf/english_paris_agreement.pdf*

[14] As per WHO: "The human right to health means that everyone has the right to the highest attainable standard of physical and mental, which includes access to all medical services, sanitation, adequate food, decent housing, healthy working conditions, and a clean environment."

causal connections to health are addressed with 19 targets in 10 other SDGs.[15]

The active involvement of the health sector in the NAP process will facilitate access to national adaptation funds and such made available through the least developed countries fund (LDCF),[16] Adaptation Fund (AF),[17] Green Climate Fund (GCF),[18] and other bilateral and multilateral funding mechanisms.

1.2 Health vulnerability and adaptation assessments or health VAA

National health VAA screen the potential health effects of climate variability and change so as to recognize the most vulnerable populations and subgroups with health risks from climate change, and identify and enact the interventions that are needed to reduce the climate-related burden of disease for the current and future generations.[19]

The degree to which programmes need to be modified to address the health risks of climate change depends on the current burden of climate-sensitive health outcomes, the effectiveness of current interventions to manage climate-sensitive health outcomes, and projections of where, when, and how health burdens could alter with changes in the mean and variability of climate.

In order to integrate its findings into a broader country framework, the national health VAA should be carried out as early as possible within the NAP process.

In 2013, WHO developed guidance and technical tools to outline a flexible process for health vulnerability and adaptation assessment or health VAA.[20]

[15] http://www.thelancet.com/pdfs/journals/lancet/PIIS0140-6736(16)31467-2.pdf

[16] http://www3.unfccc.int/pls/apex/f?p=116:1:3362156426966645::NO:::

[17] https://www.adaptation-fund.org/

[18] https://www.greenclimate.fund/home

[19] http://www.euro.who.int/__data/assets/pdf_file/0009/91098/E81923.pdf

[20] WHO, 2013. Protecting health from climate change: vulnerability and adaptation assessment. See at: http://www.who.int/globalchange/publications/vulnerability-adaptation/en/

The five steps to conduct a health vulnerability and adaptation assessment include the following actions:

(1) **Frame and scope the assessment**: Establish a project team and a management plan; establish a stakeholder process; define the geographical region and health outcomes of interest; identify the policy context for the assessment; develop a communications plan.

(2) **Vulnerability assessment**: Describe the human health risks of current climate variability and of recent climate change, and the current capacity of health and other sectors to address the risks of climate-sensitive health outcomes, denoting the public health policies and programmes that are in place to address these risks. This exercise includes describing the most vulnerable populations and regions.

(3) **Impact assessment:** Project future health risks and impacts under climate change. This includes a two-tier approach: a) Describe how the risks of climate-sensitive health outcomes, including for the most vulnerable populations and regions, may change over coming decades, irrespective of climate change; and b) Estimate the possible additional burden of adverse health outcomes taking climate change into account.

(4) **Adaptation assessment:** Identify and prioritize policies and programmes to address current and projected health risks from climate change. This includes a) identifying and prioritizing current policies and programmes that address current and projected health risks; b) identifying additional public health and health-care policies and programmes to prevent likely future climate-related health burdens; c) identifying resources for implementation and potential barriers needing to be addressed; d) estimating the costs of action and the costs of inaction to protect health; and e) identifying possible actions to reduce the potential health risks of adaptation and greenhouse gas mitigation policies and programmes implemented in other sectors.

(5) **Monitoring:** Establish an iterative process for monitoring the health risks of climate change.

1.3 The health national adaptation process or HNAP

The HNAP is the mechanism by which health components can be integrated into the NAP process. In 2014, WHO produced guidance on using the HNAP.[21] The HNAP includes as an output a detailed health adaptation plan designed to achieve the HNAP goals within a specific period of time and given available resources. HNAP is an evidence-based tool to guide health systems' adaptation.

An analysis of climate change funds awarded to various adaptation projects in 2014 and 2016 shows that a very small proportion went to the health sector, despite the fact that the vast majority of countries had prioritized health in their overall NAPs. The HNAP process is thus a vital tool in identifying health adaptation needs and sourcing the necessary funds for building climate-resilient health systems.

The five main steps of an HNAP are:

Step 1. Align the health adaptation planning process with the national process for developing a national adaptation plan, with help from formal institutional arrangements.

Step 2. Take stock of available information by identifying national and subnational research on the health risks of climate variability and change; knowledge of factors increasing/decreasing vulnerability; adaption policies and programmes undertaken; and national and regional capacity gaps to undertaking the HNAP.

Step 3. Identify approaches to address capacity gaps and weaknesses in undertaking the HNAP. This step is essentially based on a 'SWOT' (strength, weakness, opportunity and threat) analysis of the results of Step 2.

Step 4. Conduct or complete the existing comprehensive health vulnerability and adaptation assessment. It is significant to focus on vulnerability and impact evaluations, which include analysing current and future climate change scenarios; assessing climate vulnerabilities and identifying adaptation options; and reviewing and appraising adaptation options.

[21] WHO, 2014. WHO guidance to protect health from climate change through health adaptation planning. http://apps.who.int/iris/bitstream/10665/137383/1/9789241508001_eng.pdf

Step 5. Review implications of climate change on health-related development goals, legislation, strategies, policies and plans, whereby, and as mentioned earlier, coordination with health-determining sectors is also critical to identify potential synergies and promote health co-benefits.

The Least Developed Countries Expert Group (LEG)[22] conducted a regional training workshop on national adaptation plans in Myanmar in August 2015[23] to discuss initiation of NAPs at the country level. The environmental focal points from Bangladesh, Bhutan, Indonesia, Maldives, Nepal, Thailand and Timor-Leste participated in the workshop. No health representatives attended the workshop.

Delegates of 26 Member States in Asia participated in the 2nd bi-regional workshop on climate change and health[24] held in Indonesia in 2015. At this workshop, where a training module on climate and health was finalized,[25] delegates requested the South-East Asia Regional Office to organize a training workshop on the development of HNAPs in 2016.

Within the NAP, health VAA and HNAP contexts described above, and considering the ongoing progress of NAP development in the SEA Region countries, in partnership with the German Agency for International Cooperation (GIZ),[26] the South-East Asia Regional Office organized an HNAP training workshop on 16–18 November 2016 in Kathmandu, Nepal. Climate and health programme managers, health planning focal points and climate and environment focal points from Bangladesh, Bhutan, India, Indonesia, Maldives, Nepal, Sri Lanka, Thailand and Timor-Leste attended. The workshop aimed at supporting national capacity for HNAP development and implementation to ensure the timely inclusion of HNAPs in the overall NAPs.

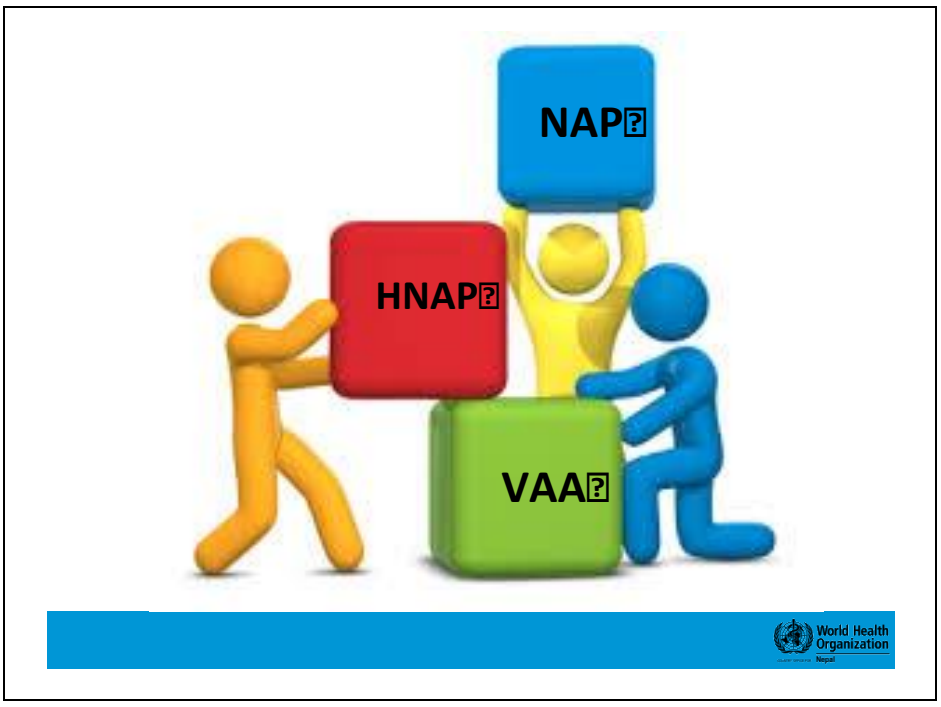
[22] The LEG was established by the COP in 2001.The LEG is requested by the COP to provide technical support and advice to the least developed countries (LDCs) on the national adaptation programmes of action (NAPAs) and the LDC work programme, and to provide technical guidance and support to the national adaptation plan (NAP) process.

[23] http://unfccc.int/adaptation/items/9066.php

[24] *The first bi-regional meeting was organized in 2007, see at:* http://apps.searo.who.int/PDS_DOCS/B3181.pdf

[25] Climate Change and Health Training Modules, see at: http://www.searo.who.int/entity/water_sanitation/documents/CCH_Training_Modules/en/

[26] GIZ Global Programme Adaptation to Climate Change in the Health Sector. See at: https://www.giz.de/fachexpertise/downloads/giz2016-0062en-health-climate-change.pdf



Source: Raja Ram Pote Shrestha, Nepal

1.4 The South-East Asia Regional Strategy to Protect Health from Climate Change

WHO has estimated that between 2030 and 2050, climate change will increase the global burden from malnutrition, malaria, diarrhoeal diseases and heat stress, causing an additional 250 000 deaths per year. The direct damage costs to health (that is, excluding costs in health-determining sectors such as agriculture and water and sanitation) is estimated to be between US$ 2 billion and US$ 4 billion/year by 2030.[27]

In the wake of the 62th session of the Regional Committee Meeting,[28] Member States of the South-East Asia Region committed to protect health from climate change and jointly developed the Regional Strategy to Protect

[27] http://www.who.int/mediacentre/factsheets/fs266/en/

[28] SEA/RC62/R2: http://www.searo.who.int/mediacentre/events/governance/rc/62/r2.pdf?ua=1

Health from Climate Change,[29] which describes the current and future effects and impact of climate change on health, proposing an action-oriented log-frame.

Conducting the national VAA and integrating the results into the NAP with help from the HNAP will definitely allow Member States of the South-East Asia Region to reach the objectives set out in the regional strategy.

The 2010 log-frame to protect Health from Climate Change envisages obtaining four outputs:[30]

Institutional arrangements: Output 1 establishes effective organizational set-ups in Member States and in the Regional Office to have an effective institutional basis to protect health from climate change, with a research/knowledge management unit in the office for health and climate change, a database and list of experts, tools to assess and monitor vulnerability and adaptation skills, and their periodic updating so as to be able to predict future risks, climate change scenarios and impacts. The log-frame projects that periodical assessment of vulnerability, and adaptation skills and processes be conducted on a) incidence of climate-sensitive diseases; b) adaptation plan/tools on development of vulnerability index-based mapping; and c) programme reports on generated knowledge being used for planning adaptation. Most important, the office for climate change and health should explore and interact with existing plans and initiatives of health and other sectors, and development partners, for co-benefits and conduct of other required research work. This would allow development of a hazard map by type, magnitude, location and population characteristics, and its periodic updating, with a mechanism in place that would allow for effective surveillance, monitoring, review, supervisory and feedback. Results would be communicated via a specific network for information exchange in countries, at regional and global levels.

Policy dialogue for adaptation: Output 2 proposes a functioning, effective and efficient management system in the office for health and climate change, for which Member States need to have corresponding effective policies, strategic directions and plans. This includes capacity for intersectoral leadership and global negotiating capacity of health sector

[29] WHO, 2015. Review of climate change and health activities in SEAR Member States Synthesis Report. See at: http://apps.searo.who.int/PDS_DOCS/B4994.pdf
[30] http://apps.searo.who.int/PDS_DOCS/B4994.pdf

professionals, managers and policy-makers, and the development and enactment of effective and relevant policies, regulations, strategies and plans. Greater management efficiency and effectiveness is to be attained through collaboration by establishing an intersectoral collaborative mechanism for deriving co-benefits and ensuring that the links between biological and environmental risks and data on their impact are made through collaboration between the health and meteorology departments.

Member States are encouraged to establish regional centres of excellence and WHO collaborating centres so as to facilitate the effective and efficient transfer of technology including measurement of the carbon footprint of health facilities and capacity to predict future vulnerabilities. Verification should be made via programme evaluation on the usefulness of transferred technologies.

Continuous monitoring and supervisory visits and review meetings, including surveillance for diseases and policies, plans and practices of other sectors, would also allow for an effective early warning system. The health and climate change programme would coordinate with the national disaster preparedness and response system and liaise to strengthen health facilities and health systems, increasing the country's capacity to manage climate-sensitive health outcomes.

Awareness and mitigation: Output 3 focuses on achieving that the health sector and individuals adapt to the health impacts of climate change and mitigate greenhouse gases efficiently. Efforts to increase awareness of the health consequences of climate change among the population, by advocating to the public, policy-makers, managers, other sectors and donors for adequate resources and functional support, would increase the allocated earmarked funds from the national budget towards more climate change protection.

These efforts go hand-in-hand with awareness-building of people, public leaders, managers in health and other sectors for efficient adaptation and mitigation in domestic, corporate and health-care settings.

Delivery of training for capacity-building and development training on health and climate change would also include working on institutional curricula at different level-related topics.

Promoting the mitigation of greenhouse gas emissions to reduce adverse health consequences from climate change would be part of the health adaptation plans. Efficiency in undertaking greening efforts in the health sector, including green public procurement and energy sources, would be verified by periodic assessments of the carbon footprint of selected health facilities.

Monitoring and reporting: Finally, output 4 looks at the effective reporting of programme implementation with the timely submission of progress reports to the Executive Board and the World Health Assembly based on resolutions SEA/RC62/R2[31] and WHA 61.19,[32] as well as the transmission of country and regional reports to relevant authorities and organizations.

Progress towards effectively taking action to protect health from climate by countries in the South-East Asia Region is measured in this status report taking into account the various frameworks and resolutions mentioned above, namely NAP, health VAA, WHA 61.19, SEA/RC62/R2 and NHAP. Results from the outcomes and case studies of the 2015 review of climate change and health activities in Member States[33] of the South-East Asia Region and of the workshop held on 16–18 November 2016 in Kathmandu, Nepal, are taken into account. Information from selected Health and WHO Climate Country Profiles[34] and from national adaptation plans submitted to UNFCCC[35] all contribute to the status report.

[31] http://www.searo.who.int/mediacentre/events/governance/rc/62/r2.pdf?ua=1

[32] http://www.who.int/globalchange/A61_R19_en.pdf?ua=1

[33] The review assessed the level of awareness of ministry of health decision-makers, climate change considerations mainstreamed into public health programmes, partnerships between health and the environment, and the level of priority given to health adaptation and mitigation in national climate change action plans. A strong recommendation was to: "Develop clear national priorities and targets for health adaptation based on NAPAs, national communications and additional vulnerability assessments, and integrate these into draft NEHAPs and HNAPs and any future iterations of national environmental action plans." See at:
http://www.searo.who.int/entity/water_sanitation/review-of-cc.pdf?ua=1

[34] http://www.who.int/globalchange/resources/country-profiles/en/

[35] http://www4.unfccc.int/nap/Pages/national-adaptation-plans.aspx

2. Status of development of health national adaptation plans in selected countries of South-East Asia

2.1 Examples of ongoing initiatives that could be enhanced by conducting VAAs and HNAPs in Bangladesh, India, Indonesia, Maldives, Sri Lanka and Timor-Leste

Bangladesh

Bangladesh is highly vulnerable to many climate hazards. The entire country is affected by one or another climate hazard such as drought in the north, flash floods and floods in the mid-region, salinity intrusion along the coastal belts and by cyclones in the coastal areas. All these hazards have direct and indirect impacts on the health of the population. There are more examples of climate hazards in the publication entitled "Climate and Health Country Profile Bangladesh-2015".[36]

The Department of Environment took the lead in developing the 2002 Initial National Communication (INC) and the National Adaptation Programme of Action (NAPA), the 2008 Bangladesh Climate Change Strategy and Action Plan, and the 2012 Second National Communication.

The 2008 national strategy for climate change considers six pillars, one of which is "Food security, social protection and health." It considers adaptation measures such as implementing surveillance systems for existing and new disease risks and ensuring that health systems are geared up to meet future demands, implementing drinking water and sanitation programmes, and undertaking mitigation actions that will have health co-benefits.

The 2nd National Communication to UNFCCC indicates the impact of climate change on health. Despite identifying a number of recommendations on adaptation measures for the health sector, none of these are budgeted nor aligned with clear timelines, conveying skepticism on whether it will bring about future adaptation success.

[36] http://apps.who.int/iris/bitstream/10665/208856/1/WHO_FWC_PHE_EPE_15.02_eng.pdf?ua=1

The country identified the Climate Change and Health Promotion Unit (CCHPU)as the national focal point for health and climate change in the Ministry of Health and Family Welfare (MoHFW).

The Department of Environment began working on the 2nd NAP process in 2015; stakeholder meetings were held in September 2016. The Climate Change and Health Promotion Unit advocated including 'health' in the NAP process.

One of the main conclusions of the 2014 WHO South-East Asia Regional Office (draft for review) provides a report on climate change and health activities in Bangladesh. While relative priority is given to health adaptation and mitigation in the country's main climate change action plans – a process led by the Department of Environment – there appears to be no integration of climate change into health policies.

A number of national health policies were scrutinized to assess the level of mainstreaming of climate change into public health programmes (such as the 1999 Water Policy; the 2005 Sanitation Strategy; the 2006 National Food Policy; the 2007–2010 Strategic Plan for Surveillance and Prevention of Noncommunicable Diseases in Bangladesh; the 2011 National Health Policy; the 2011–2015 Sixth Five Year Plan; and the 2011–2016 Health, Population and Nutrition Sector Development Plan).

Paraphrased, the mentioned report indicates that despite there being a Climate Change and Health Promotion Unit in the MoHFW, none of the examined health policy documents include a clear definition of the climate change and health sector nor a prioritization of health issues for adaptation, letting out indications on who the health sector should engage with or how, or on where and when the health sector should engage with others.

Nevertheless, some health adaptation programmes are currently being implemented, such as:

- In coordination with the Ministry of Education, the MoHFW develops and makes wide use of the manual on Climate Change and Health for School Children, approved as supplementary reading by the National Curriculum and Text Board.
- Together with the Nalta Hospital and Community Health Foundation, the MoHFW launched a community radio programme using a climate early warning system to increase

health resilience among the coastal population. It uses an edutainment approach using folk media and local languages.

- Community-based approaches for adaptation – removal of salinity of water to reduce waterborne diseases. CCHPU facilitated provision of safe drinking water in the cyclone 'Aila'-affected regions.

- Recent health and climate change research studies: *Child Centred Approach to Climate Change and Health Adaptation through Schools in Bangladesh: A Cluster Randomised Intervention Trial*- PLOS ONE (2015*);* [37] *Climate change and health in Bangladesh: a baseline cross-sectional survey*. Global Health Action (2016*);*[38] *Knowledge and perception about climate change and human health: findings from a baseline survey among vulnerable communities in Bangladesh*. BMC Public Health (2016*).*[39]

The 2014 WHO SEA Regional Office report recommends establishing an MoHFW Health Adaptation Working Group comprising representatives from government and nongovernment organizations to incorporate climate change into health policies by defining and prioritizing health issues for adaptation to climate change.

A health VAA and the HNAP process remain to be developed in Bangladesh.

India

Climate change impacts will range from affecting agriculture – further endangering food security – to sea level rise and the accelerated erosion of coastal zones, increasing intensity of natural disasters, species extinction and the spread of vector-borne diseases.

Among the main health outcomes figure vector-borne and waterborne diseases, malnutrition, respiratory diseases, heat-related illnesses, mental health and cardiovascular diseases. Because of the high probability of

[37] http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0134993

[38] *http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4821870/*

[39] See at: http://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-016-2930-3

extreme heat events in various parts of the country, exposed and vulnerable communities in densely populated areas would be severely impacted. Thermal extremes not only cause mortality but also can reduce worker productivity, with consequent social impacts.

In 2008, the Prime Minister's Council for Climate Change prepared the National Action Plan on Climate Change (NAPCC).[40] Eight national missions – Solar Mission; Enhanced Energy Efficiency; Sustainable Habitat; National Water; Sustaining the Himalayan Ecosystem; Green India; Sustainable Agriculture; Strategic Knowledge for Climate Change – form the core of the plan representing multipronged, long-term and integrated strategies to achieve key goals in the context of climate change. Health is not identified as one of the priority missions, yet the proposed programme comprises the provision of enhanced public health-care services and the assessment of increased burden of diseases due to climate change.

In 2016, the 'Mission on Health' was prepared under the 'National Action Plan on Climate Change',[41] proposing a multipronged approach to address the health-related aspects of climate change. The goal is to reduce morbidity, mortality, injuries and health vulnerability to climate variability and extreme weathers. The objective is to build capacity of health-care services against adverse impact of climate change on human health. It will identify a nodal agency at the state level for capacity-building of health personnel to carry out regional assessments of vulnerabilities, mapping and linkages with appropriate sectors to develop tools for predictability, modelling and ongoing assessment of effects of climate variability. Further, the 'Mission on Health' proposes to conduct epidemiological research in coordination with other stakeholders to develop tools to conduct health VAA directed towards preparing information for early warning systems.

An example of early warning systems was developed by the Ahmedabad Municipal Corporation and summarized as follows:

[40] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2822162/

[41] http://ncdc.gov.in/writereaddata/mainlinkfile/File604.pdf

Following a major heat wave in May 2010, which led to 1344 additional deaths registered in the city during the month of May, the Ahmedabad Municipal Corporation(AMC) prepared its first Heat Action Plan in 2013, updated in 2016.[42]

The Plan creates immediate and longer-term actions to increase preparedness, information sharing, and response coordination to reduce the health impacts of extreme heat on vulnerable populations, and has four key strategies:

1. Build public awareness and community outreach to communicate the risks of heat waves and practices to prevent heat-related deaths and illnesses, through media outlets and pamphlets, but also SMS text messages, email, radio and mobile applications such as WhatsApp and through interpersonal communication to reach vulnerable populations.
2. Initiate an early warning system and interagency coordination to alert residents on potential high and extreme temperatures. The AMC has created formal communication channels to alert government agencies, the Met Centre, health officials and hospitals, emergency responders, local community groups and media outlets on forecasted extreme temperatures.
3. Strengthen capacity-building among health-care professionals to recognize and respond to heat-related illnesses, particularly during extreme heat events. Such trainings to focus primarily on medical officers, paramedical staff and community health staff.
4. Reduce heat exposure and promote adaptive measures by using maps of high-risk areas in the city, increasing outreach and communication on prevention methods, and improving rapid access to potable drinking water and to cooling spaces during extreme heat days.

[42] https://www.nrdc.org/sites/default/files/ahmedabad-heat-action-plan-2016.pdf

In December 2016, the MoHFW Expert Group on Climate Change and Health prepared the first draft titled the National Action Plan on Climate Change and Health under the Mission on Health.

The objectives are to: (1) Create awareness on the impacts of climate change on human health among the general population (vulnerable community), health-care providers and policy-makers.

(2) Strengthen capacity of the health system to respond to climate-sensitive illnesses/diseases.

(3) Perform situational analysis to strengthen preparedness and response at national/state/district/below-district levels to cope with adverse health impacts of climate change-related disasters. 4) Assist states to assess their health vulnerabilities in the context of climate change and accordingly build capacities to adapt and mitigate vulnerabilities. 5) Develop partnerships with stakeholders in the private sector, civil society and other stakeholder government departments, and create synchrony/synergy with other missions on climate change and ensure that health is properly represented in the climate change agenda in the country. 6) Strengthen monitoring, surveillance and research capacity with regard to impact of climate change on human health, and develop a mechanism to fill the gap in the evidence-based health policy.

The health VAA that would be carried out according to Objective 4 would allow completion of the HNAP. Both processes remain to be developed in India.

Indonesia

The more than 17 500 islands in the country face various climate hazards that can affect the water, marine and fisheries, health, agriculture and forestry sectors. In the water sector, climate change may lead to a decrease in water availability, floods, landslides and droughts. Under a high emissions scenario, and without large investments in adaptation, an annual average of 4 215 700 people are projected to be affected by flooding due to sea level rise between 2070 and 2100. Heat-related deaths in the elderly (65+ years) are projected to increase to about 53 deaths per 100 000 by 2080 compared with the estimated baseline of less than 1 death per 100

000 annually between 1961 and 1990. More information is available in "Climate and Health Country Profile Indonesia –2015".[43]

In 2013, the country developed the National Action Plan for Climate Change Adaptation.[44]

The Plan provides direction for mainstreaming climate change adaptation issues in the national development planning process, and guidance for sectoral and cross-sectoral climate change adaptation action from 2013 to 2025.

Indonesia informed the UNFCCC that it "has an approved national health adaptation strategy[45] and is currently implementing projects on health adaptation to climate change. Additionally, Indonesia has conducted a national assessment of climate change impacts, vulnerability and adaptation for health and is implementing actions to build institutional and technical capacities to work on climate change. Indonesia has planned allocations from domestic funds included in the National budgeting system. Activities in the budgeting system are: capacity-building/orientation with certificated module and advocacy/socialization to the related stakeholders in all provinces".[46]

The Ministry of Health is engaged in development of national adaptation components (2015–2019), and health is included as a subsector. Three main adaptation actions are planned: strengthening and updating of information on vulnerability and risk to public health due to climate change; development of policy, planning, network, and interagency cooperation at the local, regional and national levels related to public health risk due to climate change; and capacity-building and early warning system development on climate change-related threats to public health in the community and government level.

[43] http://www.who.int/globalchange/resources/country-profiles/PHE-country-profile-Indonesia.pdf?ua=1

[44] https://gc21.giz.de/ibt/var/app/wp342deP/1443/wp-content/uploads/filebase/programme-info/RAN-API_Synthesis_Report_2013.pdf

[45] http://www4.unfccc.int/Submissions/Lists/OSPSubmissionUpload/453_265_131170958022739751-Indonesia%20Submission%20-%20NWP%20SBSTA44%20agenda%20item%203%20-%20final%2030%20Aug%202016.pdf

[46] http://www.who.int/globalchange/resources/country-profiles/PHE-country-profile-Indonesia.pdf?ua=1

The cross-sectoral working group on climate change unites all relevant programmes and expertise, and has prepared a first draft HNAP focusing on integrated risk monitoring and early warning systems.

Both processes – health VAA and HNAP – remain to be developed in Indonesia.

Maldives

More than 80% of total land area of the Maldives is less than 1 m above sea level. The whole country is at risk of being submerged by sea level rise. Dengue outbreaks are becoming more frequent and a Chikungunya outbreak in December 2006 reached epidemic proportions. Waterborne diseases increased as a result of disruption of sewage and water systems due to flooding following the tsunami in 2005, showing a 50% increase in the number of gastroenteritis cases.

Climate change impacts fisheries and agriculture, and threatens food security in the Maldives. Saltwater intrusion would also affect soil and vegetation causing impacts on agriculture and terrestrial ecosystems. Warming seas are already destroying the corals systems, affecting tourism, fisheries, food security and human settlements. More information is available in "Climate and Health Country Profile Maldives –2015".[47]

The country's national adaptation programme of action (NAPA) was prepared in 2006[48] and identified health as a priority sector requiring adaptation action. Maldives has an approved national health adaptation strategy. Additionally, actions are being taken to build institutional and technical capacities to work on climate change and health.

The Ministry of Health is implementing projects on health adaptation to climate change at several locations, such as on the Laamu Atoll:

> A "Low emission climate resilient development project" was implemented in 2016 in the Laamu Atoll of the Maldives. Major outputs of the project were as follows: Water quality assessment was conducted; strategy for

[47] http://apps.who.int/iris/bitstream/10665/246134/1/WHO-FWC-PHE-EPE-15.25-eng.pdf?ua=1

[48] http://www.preventionweb.net/files/8466_NAPAmaldives.pdf

health-care waste management strategy was developed; feasibility assessment for installing solar panels in health facilities was completed; dengue outbreak assessment and vector control training was completed; nationwide vector control campaign, including information, education and communication (IEC) and vector control equipment, was launched; and interagency emergency health kits (IEHK) were procured.

However, the detailed NAP has not yet been formulated. A national health VAA and the HNAP remain to be developed.

Sri Lanka

Sri Lanka is an island country characterized by three climatic zones; that is, dry, intermediate and wet. The country is experiencing increasing temperatures, high variability in seasonal rainfall and intense and frequent extreme events. It is also observing increasing frequency of floods and droughts. Under a high emissions scenario, heat-related deaths in the elderly (65+ years) are projected to increase to about 22 deaths per 100 000 by 2080 compared with the estimated baseline of less than 1 death per 100 000 annually between 1961 and 1990. Increasing temperatures could encourage the spread of vector-borne diseases such as malaria and dengue fever. Polluted surface water, secondary to floods and extreme weather events, increases the risk of vector-borne, rodent-borne, foodborne and waterborne diseases. More information is available in "Climate and Health Country Profile Sri Lanka –2015."[49]

To address the impacts of climate change, the country developed several policies and plans:

- Climate change policy
- Two national communications on climate change – in 2001 and in 2011
- 2011–2016 National adaptation plan for climate change
- Sector vulnerability profiles for five sectors, including health

[49] http://apps.who.int/iris/bitstream/10665/246141/1/WHO-FWC-PHE-EPE-15.45-eng.pdf?ua=1

- Technology needs assessments (TNA) for five adaptation sectors and three mitigation sectors
- Green Lanka National Action Plan – Mission 3
- 2015–2024 National adaptation plan for climate change (draft)[50]

The Ministry of Mahaweli Development and Environment through its Climate Change Secretariat spearheads the process that led to developing, in 2010, the 2011–2016 National Climate Change Adaptation Strategy.[51] In 2012, the National Climate Change Policy [52] was adopted. Health is addressed as one among nine sectors identified as most vulnerable to climate change.

The Ministry of Environment initiated the NAP process first by convening a team from relevant sectors to take stock and synthesize available information and evidence. Documents such as the two national communications of climate change in 2001 and in 2011; sector vulnerability profiles – five sectors including health, technology needs assessment for adaptation and mitigation, and relevant research data were reviewed. Nine priority areas and cross-sectoral areas were identified. Sectoral committees were formed, including for health. These committees were familiarized on the NAP development process through brainstorming sessions and consultative workshops.

To develop the adaptation plan for the health sector in line with the Health Master Plan, the Directorate of Environmental and Occupational Health that coordinates the climate and health programme in the country formed a group with intra-sectoral experts and other relevant stakeholders. After a literature review and through several consultative meetings, the group analysed major risks for the health sector and assessed socioeconomic outcomes, prioritizing four thematic areas. Climate change is incorporated into climate-sensitive programme planning, and activities such as vector-control programmes are carrying out climate and vector studies, and climate is also included in nutrition policy. It conducts training and awareness sessions for public health staff.

[50] http://www.climatechange.lk/NAP/2nd%20Draft%20of%20the%20National%20Adaptation%20Action%20Plan.pdf
[51] http://www.climatechange.lk/NAP/National%20Adaptation%20Action%20Plan_LatestVersion.pdf
[52] http://www.climatechange.lk/CCS%20Policy/Climate_Change_Policy_English.pdf

The Ministry of Health's national policy and strategy on cleaner production for the health sector introduced the 'green hospital' concept to minimize greenhouse gas emissions from the health sector. Solar panels were installed in the national hospital and environmentally friendly technologies for waste management were initiated in selected health facilities.

HNAP has been drafted and it may need to be revised to allow identification of current needs (previous assessments were undertaken some time ago), development of an integrated disease surveillance and response system, which would include climate information and plans to conduct a valuation of the health co-benefits of climate change mitigation policies.

Timor-Leste

In Timor-Leste, about 70 % of the total population is exposed to climate change-induced vulnerabilities, as they are basically dependent on the delivery of ecosystems with natural resources through agriculture, forestry and fisheries for their livelihoods. Food security is one of the most critical challenges facing Timor-Leste today, and it is likely to be compounded by the effects of climate change on agricultural production. Climate change also impacts on health, water availability, biodiversity and infrastructure. More information is available in "Climate and Health Country Profile Timor-Leste – 2015".[53]

The country's national adaptation programme of action on climate change (NAPA) was launched in 2010.[54] Health is one of the six priority sectors detailed in the NAPA. The Environment Health Unit under the Ministry of Health is responsible for the climate and health programme. It is in the process of planning to develop a national policy and strategy on climate change that would include the review of existing policy, strategy, standards and guidelines of all health programmes to update them for increased climate resilience.

Timor-Leste informed the UNFCCC that it has an approved national health adaptation strategy and has conducted a national assessment of

[53] http://www.searo.who.int/entity/water_sanitation/tls_c_h_profile.pdf?ua=1

[54] http://unfccc.int/resource/docs/napa/tls01.pdf

climate change impacts, vulnerability and adaptation for health. Developing a national strategy for climate change mitigation, which includes consideration of the health implications of climate change mitigation actions and a valuation of co-benefits to health of climate mitigation policies as part of the health VAA, would enable the country to conduct an HNAP process.

2.2 Examples of successful national health adaptation processes in Bhutan, Nepal and Thailand

Bhutan

Bhutan is vulnerable to several climate induced hazards such as Glacial Lake Outburst Floods due to temperature rise, land degradation due to landslides, erosion caused by changes in weather patterns, flashfloods due to intense rainfall periods and cyclones, droughts and withering of water sources due to longer intervals between rains, extreme wind and thunder storms and increase in agricultural pests and diseases.

The country's main climate change policies are coordinated by the environment sector: the 2004 National Adaptation Programme of Action (NAPA)[55] – which mentions some health and health-related vulnerabilities – and the 2011 Second National Communication (SNC),[56] in which health is seen as both a standalone and a cross-cutting issue.

The SNC has a number of adaptation priorities for the health sector such as "ensuring safe drinking water, controlling vector-borne diseases, strengthening disaster management and preparedness, improving surveillance systems, building climate change and health research capacity, and reducing nutritional effects". Yet, none of these priorities are costed nor are aligned with clear timelines.

The national Multi-Sectoral Technical Committee on Climate Change (MSTCCC) was formed in 2011 to coordinate all climate change issues in the country. The committee comprises members from various government sectors, nongovernmental organizations and the private sector; yet, the health sector is not represented on this committee.

[55] http://unfccc.int/resource/docs/napa/btn01.pdf

[56] http://unfccc.int/resource/docs/natc/snc_bhutan.pdf

Climate change and health activities operate within the Environmental Health Programme within the Department of Public Health in the Ministry of Health. There is one staff member with dedicated responsibility for climate change and health, yet mainly focusing on water and sanitation engineering. From 2010 to 2016, the Ministry of Health implemented a Global Environment Facility (GEF)-funded pilot project on health adaptation to climate change, with technical support from WHO.

A national vulnerability and adaptation assessment was carried out with the support of local consultants and WHO in 2010. The key vulnerable sectors identified by the health VAA are water resources, forests and biodiversity, agriculture, energy and human health. The health element of the VAA focused on current and future risks related to malaria, dengue, Japanese encephalitis, and emergent diseases such as kala-azar (Visceral leishmaniasis), chikungunya, filariasis and diarrhoeal diseases. The importance of other climate-sensitive health conditions such as malnutrition, food insecurity and safety and respiratory disease were also considered. Bhutan does not yet have a national health and climate change strategy.

In the 2014 WHO SEA Regional Office report (draft for review) on climate change and health activities in Bhutan, one of the main conclusions was that there was no integration of climate change into health policies. Two key national policies were examined to assess the level of mainstreaming of climate change in public health programmes: the 2012 National Health Policy or NHP[57] and the 2013–2018 Eleventh Five Year Plan – National Health Sector.[58] The report indicates that, paraphrasing it, there is only one reference to climate change in the NHP indicating that "Prediction, Preparedness and Mitigation measures to address adverse effects of climate change on health shall be put in place through comprehensive multisectoral plan /emergency preparedness and public education on behavioural adaptations."

The report recommends to boost the capacity of health sector staff working on health and climate change – for instance, in the number and technical capacity of medical doctors who are trained in climate-sensitive diseases, and to enhance cross-sectoral "collaboration as a major factor to

[57] http://www.gnhc.gov.bt/wp-content/uploads/2012/04/nationalHpolicy.pdf

[58] https://mail.google.com/mail/u/0/#inbox

strengthen in order to address priority areas that lie beyond the direct purview of the health sector", as an example the reports notes that "meteorological data needs to be tailored and made more meaningful for the social and health sectors, as well as for end-user communities".

The National Environment Commission Secretariat is taking the lead in developing the country's NAP that was formally launched in May 2015. Health is one of the sectors involved in the ongoing NAP process.

The HNAP process was formally launched in October 2016, wherein it remains to be developed. Several central health staff and district health officers and community health workers from programmes – such as Vector-Borne Disease Control; Water and Sanitation; Emergency Medical Services; Nutrition; Health Infrastructure Development; Policy and Planning and Health Promotion – provided inputs to the draft framework of the HNAP, as did staff from the hydrometeorology and agriculture sectors as well as academia and NGOs.

Bhutan considers using its HNAP to develop its 12th 5-year plan, to start soon. The HNAP will help mainstream climate in the planning processes of the health sector and other determining sectors.

Nepal

Nepal is a landlocked country with extreme variations in climate by altitude (60 m–8848 m). The average annual precipitation is 1500 mm, and 90% of total rainfall occurs during the summer monsoon. Average temperature increased to 0.6 °C per decade, and extreme climatic events have increased. Nepal is one of the most vulnerable countries to climate change although its national carbon footprint is low. It is projected that temperature increase in Nepal will be 1.4 °C by 2030, 2.8 °C by 2060 and 4.7 °C by 2090 (HNAP 2015). The glacier retreat rate is estimated to be 10 m–60 m/year, and the country faces increase risk of Glacial Lake outburst flood event (Source: ICIMOD 2014).

Climate-sensitive health risks in Nepal are vector-borne diseases in highland areas, waterborne diseases such as diarrhoea, foodborne diseases, malnutrition, cardio-respiratory illnesses, psychological stress, extreme weather-related health effects and injuries. Some studies carried out in Nepal show the early effects of climate change with clear expansion of autochthonous cases of vector-borne diseases and their vectors VBDs to

non-endemic areas, including into the Highlands. Millions of Nepalese are estimated to be at risk from the impacts of climate change, including reductions in agricultural production, food insecurity, strained water resources, loss of forests and biodiversity, reduced tourism and damaged infrastructure and their associated impacts on health. More information is available in "Climate and Health Country Profile Nepal – 2015".[59]

The constitution of Nepal gives every citizen the right to live in a healthy and clean environment, the right to health care, and the right to access clean water and hygiene. The Climate Change Council, established in 2009, is the main political body responsible for guiding climate change policies in Nepal. It is chaired by the Prime Minister and comprises members from key national, local and sectoral ministries. The Ministry of Science, Technology and Environment coordinates climate change planning and reports directly to the Climate Change Council.

The country's NAPA[60] was prepared in 2010 by the former the Ministry of Science, Technology and Environment now reformed as the Ministry of Population and Environment and national focal point for climate change, with the help of the Multi-stakeholder Climate Change Initiatives Coordination Committee (MCCICC), which includes a representative of the Ministry of Health and serves as the key national platform for ensuring regular dialogue and consultations.

In the NAPA, public health features as one of the most vulnerable sectors to climate change, and adaptation projects addressing urgent and immediate needs were identified. The country's National Climate Change Policy (2011)[61] also identifies public health as one of the most vulnerable sectors. The policy documents encourage sector-wide collaboration and integration of climate change in all relevant sector plans.

Before the country conducted a health VAA in 2015, an estimation of the potentially vulnerable population and districts in terms of climate-sensitive diseases in Nepal was presented in 2014 in the country's Second National Communication.[62] A total of 13.3 million people were identified as being most at risk from climate-sensitive diseases such as malaria,

[59] http://apps.who.int/iris/bitstream/10665/246135/1/WHO-FWC-PHE-EPE-15.27-eng.pdf?ua=1
[60] http://unfccc.int/resource/docs/napa/npl01.pdf
[61] https://ldcclimate.files.wordpress.com/2012/05/climate-change-policy-eng-nep.pdf
[62] http://unfccc.int/resource/docs/natc/nplnc2.pdf

lymphatic filariasis, Japanese encephalitis, kala-azar and waterborne diseases – mainly in the Terai region.[63]

The Ministry of Population and Environment launched the national adaptation plan (NAP) formulation process in September 2015. The Nepal NAP process builds on the experiences of the NAPA process, with the prospect to set in place more sustainable and permanent institutional arrangements for continuous and iterative adaptation planning, seeing that climate change issues are integrated into all relevant national development planning, budgeting and decision-making processes. The NAP will cover nine thematic sectors.[64] Gaps in, and needs for, technical capacity, data and information required at various levels of adaptation planning will also be addressed.

The Ministry of Health is preparing a health sector strategy to address climate. Despite the fact that the 2014 National Health Policy[65] hardly mentions the links between health and climate change, the Division on Disease Control, Climate Change and Environmental Health in the Ministry of Health and the Ministry of Water Supply and Sanitation are implementing the DFID-funded and WHO-supported project entitled "Building adaptation to climate change in health through resilient WASH". Through this project, a health VAA[66] and an action plan for the HNAP are being developed.

In 2015, the Ministry of Health and Population, with the help of a multisectoral national and international expert team, completed the national VAA by dividing the whole nation into 15 clusters to have a region-wide analysis. Health impacts due to climate change were grouped into three categories: (a) extreme weather-related health impacts such as heat wave or heat stress and cold wave; (b) vector-borne diseases including Japanese encephalitis, malaria, kala-azar and dengue; and (c) diarrhoeal diseases.

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[63] http://unfccc.int/resource/docs/natc/nplnc2.pdf

[64] *1) Agriculture and food security; (2) Forest and biodiversity; (3) Water resource and energy; (4) Public health; (5) Climate-induced disasters; (6) Urban settlement and infrastructure; (7) Tourism, natural and cultural heritage; 8) Gender and marginalized groups; and (9) Livelihoods and governance.*

[65] http://nhsp.org.np/national-health-policy-2014-3/

[66] *The health VAA is being conducted following WHO/PAHO document on Protecting Health from Climate Change: Health Vulnerability and Adaptation Assessment.*

The team reviewed available health sector strategies and plans; evidence on vulnerability and adaptation assessments; research studies; meteorological data from the Department of Hydro-meteorology; health data from the Health Management Information System, the Nepal Demographic Health Survey and the Nepal Living Standard Survey; demography data from the Central Bureau of Statistics; and food security data from the Nepal Planning Commission and the World Food Programme (WFP).

When the districts were analysed in terms of the magnitude of the population's health vulnerability, 10 Tarai districts and 11 out of the total 55 mountain and hill districts showed the highest vulnerability.[67]

The VAA concluded that: "Vulnerability to climate change varies with the population characteristics, geographical location, settlement types, occupational groups, and the social, political and cultural aspects. Different intervention measures such as preventive, curative, promotive and rehabilitative are being practiced by the public health sector to cope with the type of diseases, prevalence needs and additional coping strategy to enhance the adaptive capacity of the people. The adaptation measures especially for climate-sensitive diseases need to be addressed at different levels such as personal, community and policy levels."

The major recommendations relate to policy enhancements and improving surveillance systems, service delivery and resource mobilization. The VAA underlined the need to implement a national climate change health adaptation strategy.

In 2016, the Ministry of Health and Population, integrating the results of the health VAA, prepared a first draft of the "Climate Change Health Adaptation Strategies and Action Plans of Nepal (2016–2020)", which is the country's HNAP. The summary of the draft HNAP plan is shown in Table 1 below.

[67] The 11 most vulnerable districts are 2 in the Far West Mountain, 3 in the Mid-Western Hill, 4 in the Mid-Western Mountain and 2 in the Western Hill clusters. Marginal regions such as these are characterized by the ruggedness of terrain with slopes above 30°, mostly inaccessible by roads, dispersed settlements and poor socioeconomic infrastructure, education, health and employment.

Table 1: *Summary of the HNAP of Nepal*

Vision: Develop climate resilient health system to protect human health from climate change in Nepal.
Mission: Creating a national framework for engaging the public, private sector, civil society organizations and development partners in a participatory process for responding to adverse health effects of climate change.
Goal: To reduce vulnerability and enhance adaptation measures to reduce adverse effects of climate change on human health.
Specific objectives of implementation of this strategy and action plan:
To raise public awareness about climate change and its health impacts;
To generate evidence on the health effects of climate change;
To reduce morbidity and mortality of infectious diseases attributed to climate change;
To manage the risk of extreme climatic events;
To protect human health from adverse effects of climate change through multisectoral response ensuing health in all policies;

A valuation of the co-benefits to health of climate change mitigation policies is still to be conducted.

Thailand

The main climate change impacts are heat, flood, drought and sea level rise and the expected health risks are vector-borne, heat-related and respiratory diseases. Early studies on the impact of climate change on rice and maize yields found that crop yields varied substantially. A technical relationship between temperature and the growth rate of mosquitoes was used. It was concluded that global warming would enhance the potential spread of malaria within the first half of the century. Under a high emissions scenario, and without large investments in adaptation, an average of 2.4 million people are projected to be affected by flooding due to sea level rise every year between 2070 and 2100 ("Climate and Health Country Profile Thailand – 2015).[68]

[68] http://apps.who.int/iris/bitstream/10665/208870/1/WHO_FWC_PHE_EPE_15.16_eng.pdf?ua=1

A National Committee on Climate Change Policy was set up under the chairmanship of the Prime Minister. Health is one of the six priority sectors in the national climate change adaptation plan.

The Ministry of Public Health has a policy on protecting human health from climate change, using health in all policy concepts and promoting green hospitals at all levels.

Thailand is currently implementing projects on health adaptation to climate change and is taking action to build institutional and technical capacities to work on climate change and health.

The Office of National Resources and Environmental Policy and Planning of the Ministry of Natural Resources and Environment are currently developing the national Climate Change Master Plan (2013–2050).

The Cabinet assigned the Ministry of Public Health the task to develop the 2015–2020 Health Strategic Plan on climate change and health; a first draft has been developed.[69] This strategic plan will be a national framework for building resilience to climate impacts and health risks that includes adaptation and mitigation measures.

The HNAP has been drafted and was submitted to the Ministry of Public Health Board at the end of 2016, to be tabled to the National Committee on Climate Change Policy for Cabinet approval by March 2017. The Permanent Secretary of the Ministry of Public Health is a member of this committee. Representatives from various ministries and agencies sit in subcommittees to develop and guide implementation of mitigation and adaptation measures**.**

Once the Ministry of Public Health Board approves the HNAP, Thailand plans to align the HNAP with a health national strategic plan for the next 20 years and raise awareness among health workers.

[69] http://www.searo.who.int/thailand/areas/phe-country-profile-thailand.pdf?ua=1

3. HNAP and national health adaptation planning to protect health from climate change: An outlook

Protecting health, and in particular protecting health against climate change, calls for health goals to be better integrated by liaising with the sectors and players that also fundamentally influence health determinants such as poverty, inequity, illiteracy, land-use patterns and food security. This complex task stands ahead of all governments who committed to reach the SDGs by 2030, and notably of the health ministries and their partners to reach the 28 health-related SDG targets, 19 of which are not under the direct responsibility of the health sector.

To facilitate the process to formulate and implement national climate change mitigation and adaptation plans, specific tools were developed and used. Yet, the development of instruments was not straightforward – indeed, the more holistic NAP concept only came some 10 years after many NAPAs had been completed. This is one reason why many countries in the South-East Asia Region have not yet developed their NAPs. In addition to this delay, the fact that conventionally most, if not all, climate change-related action has been under the responsibility of the environment sector, with health only peripherally involved.

As a result, while the majority of countries have taken some action to integrate the protection of human health into national planning processes, so far, only three countries out of nine have effectively developed a national health VAA and carried out their HNAP.

All other countries in the South-East Asia Region have initiated if not already completed several of the seven activities needed to complete a health VAA.

The health VAA consists of the following summarized steps:

(1) Identification of relevant stakeholders;

(2) Description of current burden of climate-sensitive health outcomes, including populations and regions that are most vulnerable;

(3) Description of how the current burden of climate-sensitive health outcomes is likely to change over coming decades irrespective of climate change;

(4) Description of the effectiveness of current policies, programmes and activities;

(5) Estimation of the possible additional burden of adverse health outcomes due to climate change;

(6) Identification and prioritization of public health and health-care interventions to reduce likely future health burdens; and

(7) Identification of strategies to monitor and evaluate the burden of climate-sensitive health outcomes and implementation of interventions to address these burdens, ensuring continued effectiveness in a changing climate.

The purpose of an HNAP is to ensure that the health sector works with partners in the environment and other related communities, and follows a systematic process to engage in the overall NAP process at the national level. This strategy will allow identification of national strategic goals for building health resilience to climate change; and helps in the development of a national plan with prioritized activities to achieve these goals within a specified time period and given resources.

The process of completing the HNAP includes laying the groundwork by taking stock of all health and climate-relevant information, conducting the national VAA, developing a health adaptation strategy that considers strengthening health systems, developing an implementation plan, making sure that the HNAP is aligned throughout and in synergy with the NAP. Follow-up action focuses on monitoring, reviewing, updating and communicating the results from the HNAP.

The representatives of the selected countries in the South-East Asia Region attending the HNAP workshop held in Nepal in December 2016 were able to learn from mutual experiences and committed to complete/ further mature their national HNAP in 2017. Accordingly, the nine countries presented the activities planned for 2017 as follows:

Country	Main activities planned for 2017
Bangladesh	• Hold stakeholders' meeting to develop HNAP – December 2016 • Include the health sector to participate actively in revision of the Bangladesh climate change strategy and action plan that is ongoing • Arrange budgeting and resource mobilization– WHO, World Bank, GIZ, Bangladesh climate change trust fund • Form of a multisectoral technical working group
Bhutan	• Form a task force for HNAP development (November 2016) • Convene a workshop with task force members (December 2016) • Write-shop for HNAP to develop detailed action plan with costing and plan for M&E framework (February 2017) • Convene a multisectoral stakeholder workshop to review and prepare final draft (April 2017) • Have WHO and a few representatives from Member States review the draft HNAP (May 2017) • Present to High-Level Committee in the ministry for endorsement (June 2017)
India	• Form a multisectoral national task force • Have a brainstorming session • Hold a stakeholders' meeting • Arrange for budgeting and resource mobilization – Government of India, WHO, Ministry of Environment • Form a multisectoral technical working group • Develop an integrated action plan
Indonesia	• Review draft HNAP in line with WHO guidance • Form multisectoral working group from all programmes and expertise • Assess vulnerability and adaptation • Integrate risk monitoring and early warning system

Country	Main activities planned for 2017
Maldives	• Identify stakeholders • Meet with stakeholders and brief them on the importance of development of an HNAP in Maldives • Draft HNAP aligning the previous action plans • Present the draft HNAP with all the stakeholders for comments • Submit the final HNAP to President's Office (Maldives) for endorsement • Disseminate after endorsement from the President's Office • Implement the HNAP in Maldives
Nepal	• HNAP is already submitted for approval • Cabinet to endorse HNAP • Ensure wider dissemination of HNAP • Align with NAP • Present HNAP in NAP TWG meeting • Mainstream climate change in health policy and planning integrate priority activities of HNAP in NHSSIP (2016–2021), which is in preparation process • Implement climate change and health activities • Promote intersectoral coordination for mitigating climate change

Country	Main activities planned for 2017
Sri Lanka	• HNAP has been drafted. • Share the draft with multisectoral stakeholders • Convene the multisectoral Sectoral Committee within health to review progress of the action plan annually under the chairmanship of the Secretary of Health • Establish a database on research data relevant to climate change, and disseminate it to other inter- and intra-sectoral units – perform continuous active monitoring • Incorporate climate change in other inter- and intra-sectoral policies • Present progress at the NAP review meetings regularly • Facilitate financing of the National Planning Department and General Treasury • Share progress and best practices within the Region through WHO and Agreement/UNFCCC • Strengthen research and development • Promote multidisciplinary research • Promote data sharing through the Meteorology Department
Thailand	• HNAP has been drafted already • Carry out further literature reviews • Set up task force • Hold key sector meeting and finalize HNAP • Submit to the Ministry of Public Health, national climate change committee and Cabinet

Country	Main activities planned for 2017
Timor-Leste	• Develop national policy and strategy on climate change with key focus on minimizing health impact of climate change • Review policy, strategy, standards and guidelines existing of all health programmes in respect of climate change and update for climate resilience • Establish a regular meeting with the climate change and health working group to update the progress of activities at national level • Ensure internal and external coordination for health programmes and relevant sector implementation for climate change • Establish networking with Health Research Centre of National Health Institute to carry out research for exploring potential impact of climate change on health • Ensure services delivery response on the impact of climate change • Strengthen monitoring and evaluation

Participants requested the following support from WHO and GIZ and other partners:

- Technical backstopping and financial support to review and finalize HNAP.
- Technical assistance in vulnerability assessment.
- Technical support for climate data analysis and reassessments of projections.
- Technical support for development of climate adaptation guidelines for community level.
- Technical support for setting up a platform for sharing health and climate information between countries.
- Facilitate training on health and climate for health staff.
- Facilitate the exchange of intra-regional experts from Nepal, Bhutan, Sri Lanka and Thailand during the HNAP formulation process in countries that are yet to develop it.

Based on the successful implementation of in some countries of the South-East Asia Region, the following factors should be considered for development of an HNAP:

- Need to include all relevant stakeholders and policy-makers.
- Taking a risk management approach to implement the HNAP is likely to be most effective. This includes monitoring, evaluation and learning important components to ensure adaptation measures are and remain effective.
- Adaptation and mitigation measures go hand-in-hand with research. While health and climate research is important, lack of research should not be a reason for inaction. Involving academia would be a good strategy for initiating/ completing research.
- Constraints and barriers need to be explicitly addressed.
- As gaps between climatic parameters and disease surveillance data validity may be a challenge, to opt for having separate monitoring systems for climate-sensitive diseases under the integrated disease surveillance could be useful.
- Due to competing priorities, countries may face issues with budget allocation for streamlining climate change activities. This challenge may be attended by working in a cross-sectoral manner with all the related programmes of national, regional and local partner entities that directly or indirectly address the climate-sensitive diseases, ensuring that health-related climate risks are embedded in their programme planning.
- Adaptation will affect and be affected by development pathways, within the context of other pressing health needs.
- Monitoring and evaluation of adaptation plans need to have clear process and outcome indicators.
- Environmental health included in the Constitution of the country and/or in the national health policy, such as in Nepal, where environmental health is a fundamental human right – "every citizen shall have the right to live in a healthy environment" – helped trigger the HNAP process; this is also the case in Bhutan.

- Capacity development should be part of the implementation strategy to ensure that adequate knowledge and skills are available to review the HNAP and to revise it to accommodate new information or evidence and progress in measures to adapt to climate change.
- Capacity-building should be seen as one aspect in the broader framework of capacity development. In this context, 'capacity' means the ability of people, organizations and societies to manage their own sustainable development processes and adapt to changing circumstances. Capacity development should be viewed as a holistic process.
- Capacity development may be based on the following concepts to get maximum benefit:
  - Organizational development: promote organizational learning and raise the performance and flexibility of an organization.
  - Development of cooperation partnerships: establish and develop cooperation between organizations to improve coordination and performance; establish and develop networks for knowledge sharing and co-creation.
  - Development of enabling frameworks: develop enabling legal, political and socioeconomic frameworks so that individuals, organizations and societies can develop and raise their performance capability.

The following recommendations on the role of the health sector in climate change mitigation and adaptation could support the increase in comprehensiveness of the strategy to implement the HNAP.[70]

For mitigation

- To carry out health impact assessment of mitigation strategies: Conduct epidemiologic research to estimate and document changes in health outcomes that result directly from mitigation actions.

[70] *Anthony J. McMichael, http://www.nejm.org/doi/pdf/10.1056/nejmra1109341*

- To limit carbon (and other environmental) footprint related to the health-care system: Design buildings, transport services and facilities to achieve energy efficiency, in terms of energy sources and use, and to minimize waste.
- To enlist health professional organizations and government health departments: Educate the public about risks to health from climate change and explain that mitigating actions can confer additional, local health benefits.
- To include physicians and other health-care workers as citizens: Participate in wider public discussion and moderate personal behaviours.

For adaptation to lessen health risks

- To provide adequate health-care facilities and services: Improve facilities for handling increased patient volume resulting from extreme weather events and ensure adequate stocks of vaccines.
- To anticipate necessary surge capacity (for example, for major heat waves, fires, epidemics).
- To coordinate with emergency-services agencies and ambulance facilities and consider morgue capacity.
- To reinforce and extend public health programmes to provide a foundation for dealing with most types of climate-related health effects: Develop early-warning systems (for example, for heat waves, floods and possible epidemics); programmes for infectious-disease surveillance and analysis, vaccination and vector control (for example, mosquitoes, ticks); support for vulnerable communities; and mental health services (for example, for postevent trauma and depression).
- To educate and train the health workforce: Develop programmes that prepare health-care workers to contribute to public education and to be alert for unexpected diagnoses.
- To engage in broader collaboration with other sectors: Institute policies for creating green spaces in cities (to promote physical and mental health); develop housing design and insulation to

optimize health protection; consider livestock and wild animals as possible risks for infection.

- To ensure that every pregnancy is wanted, every childbirth is safe and every young person's potential is fulfilled: Facilitate the provision of adequate sexual and reproductive health education for both boys and girls.

The WHO Regional Office for Europe assessed the current status of Member States' activities to mitigate or adapt to the health effects of climate change. The Regional Office identified gaps in knowledge and capacity, shared experiences and information on best practice in developing and implementing effective adaptation and mitigation measures to increase the effectiveness of health adaptation strategies. For this purpose, a questionnaire was developed and is presented in detail in Annex 5. It contains indications that may be of use for countries in the South-East Asia Region in terms of examining for the completeness of their national planning activities.

One additional tool, which is useful for supporting countries as they develop comprehensive health adaptation plans, is WHO's operational framework to strengthen health resilience to climate change.

The framework provides practical guidance on how the sector and its operational basis, and health systems, can systematically and effectively address the challenges increasingly presented by climate variability and change.

To ensure that climate resilience builds on and strengthens existing health systems, its six building blocks (inner circle) are taken as a starting point for the expansion of primary components that specifically enhance climate resilience. By implementing the 10 components laid out in this framework (outer circle), health organizations, authorities and programme managers will become better able to anticipate, prevent, prepare for and manage climate-related health risks.

Annex 1

Regional Strategy to Protect Health from Climate Change: Log-frame

(See at: http://apps.searo.who.int/PDS_DOCS/B4994.pdf)

Output 1: Establishment of an effective organization at Member State level and SEARO

Expected result 1: Health sector has an effective institutional basis to protect health from climate change

Activity 1.Establishment of an office with (1) focal point, (ii) terms of reference, (iii) technical/advisory/expert committees/ working groups, (iv)skilled staff, (v) funds. Verification: Programme report on Focal point's office functioning effectively.

Expected result 2: Climate Change Units in the country and at SEARO are managing knowledge effectively

Activity 2.Establishment of research/knowledge management unit in the office for climate change and health Verification: Effective exchange of information and experiences between different levels, sectors, countries and regions. Programme report.

Activity 3. Establishment of database and list of experts. Verification: Programme report on use of experts.

Activity 4. Development of tools to assess and monitor vulnerability and adaptation skills, and their periodic updating Availability of the tools. Verification: Programme report on Assessment tool.

Activity 5. Development of capacity to predict future risks, climate change scenarios and impacts. Predicted future climate scenario. Verification: Study report.

Activity 6. Conduction of periodical assessment of vulnerability, and adaptation skills and processes. Verification: a) Study report on incidence of climate sensitive diseases; b) Adaptation plan/ tools on development of vulnerability index based mapping; c) Programme report on generated knowledge being used for planning adaptation.

Activity 7. Study of existing plans and initiatives of the health and other sectors, and development partners for co-benefits and conduction of other required research work Verification: Programme evaluation on number of study findings that were used for decision-making.

Activity 8. Development of a hazard map by type, magnitude, location and population characteristics, and its periodic updating. Verification: Programme report on availability of hazard map.

Activity 9. Establishment of an effective surveillance, monitoring, review, supervisory and feedback mechanism Functioning of nodal level laboratories. Verification: Spot verification.

Activity 10. Conduction of forum for information exchange. Evaluation report on effectiveness of networking among in-country, regional and global forums.

Output 2: Functioning of an effective and efficient management system

Expected result 3: Member States have effective policy, strategic direction, and plans.

Activity 11. Development of capacity for intersectoral leadership and global negotiating capacity (of health sector professionals, managers and policymakers). Verification: Programme report on amount of international financial support obtained.

Activity 12. Development and enactment of effective and relevant policies, regulations, strategies and plans Verification: Programme evaluation on effectiveness of the regulations.

Expected result 4: Greater management efficiency and effectiveness have been attained through collaboration

Activity 13a. Establishment of an intersectoral collaborative mechanism for deriving co-benefits. Verification: Programme evaluations on demonstrable derivation of co-benefits.

Activity 13b. Establishment of links between biological and environmental risks and data on their impact. Verification: Programme evaluations on collaboration between the health and meteorology departments.

Activity 14. Establishment of regional centres of excellence and collaborating centres. Verification: Programme evaluation on utility of support from the regional centres.

Activity 15. Effective and efficient transfer of technology including measurement of the carbon footprint of health facilities and capacity to predict future vulnerabilities. Verification: Programme evaluation on the usefulness of transferred technologies.

Activity 16. Continuously conducting monitoring and supervisory visits and review meetings, including surveillance for diseases and policies, plans and practices of other sectors. Verification: Programme report on use of intersectoral monitoring reports in decision-making.

(Note: no Activity 17)

Activity 18a. Establishment of an effective early warning system. Verification: Programme evaluations on a) Early management of outbreaks, b) Timely movement to shelter.

Activity 18b: Establishment and functioning of a disaster preparedness and response system. Verification: Programme evaluations on a) Conduction of multisector drills, b) Effectiveness of rescue operations, c) Efficiency of mass casualty management capacity.

Activity 19. Strengthening of health facilities and health systems. Verification: Programme evaluations on a) Disaster proofing of the health facilities, b) Capacity to manage climate sensitive health outcomes.

Output 3: Health sector and the people adapt to the health impacts of climate change and mitigate greenhouse gases efficiently

Expected result 5: Increased awareness of the health consequences of climate change among all

Activity 20. Advocacy to the public, policymakers, managers, other sectors and donors for adequate resources and functional support. Verification: 1. Earmarked funds from annual budget and percentage of national budget allocated and Programme evaluation on value of co-benefits attained.

Activity 21a. Awareness building of the people, public leaders, managers in health and other sectors for efficient adaptation and mitigation in domestic, corporate and health-care settings. Verification:, Verification: Programme evaluation on 1.

Percentage of households practicing mitigation and adaptation measures 2. Percentage of health facilities practicing mitigation and adaptation measures.

Activity 21a. Provision of training and logistics. Verification: Programme evaluation.

Activity 22. Inclusion of climate change, health and nutrition related topics in institutional curricula at different levels. Verification: Programme evaluation Knowledge of students on the impacts of climate change on health and nutrition.

Expected result 6: Better management of the health consequences of climate change and mitigation of greenhouse gas emission

Activity 23. Implementation of adaptation plans. Verification: Programme evaluation Prevalence rates of most common climate sensitive diseases.

Activity 24a. Undertaking of greening efforts in the health sector, including green public procurement and energy source. Verification: Verification: Programme evaluation.

Activity 21b.Periodic assessment of the carbon footprint of the health facilities. Verification: Programme evaluation on measurement of the carbon footprint of selected hospitals.

Output 4: Effective reporting of programme implementation

Expected result 7: Timely and complete reports are available on the progress and effects/impacts of the activities

Activity 25. Submission of progress reports to the Executive Board (EB) and World Health Assembly based on EB RC 5 and WHA 61.19 (global workplan). Verification: Submitted reports and percentage of required reports submitted in a timely and complete manner.

Activity 26. Submission/transmission of in-country/Regional reports to relevant authorities and organizations. Verification: Submitted reports and percentage of required reports submitted in a timely and complete manner.

Annex 2

Overview of progress towards developing HNAP in selected SEAR countries

By March 2017	BAN	BHU	IND	MAL	INO	NEP	SRL	THA	TLS
Completed NAP									
A. Groundwork	X	X			X		X	X	
B. Preparatory Elements	X	X			X		X	X	
C. Implementation Strategies					X			X	
D. Reporting monitoring and review									
Completed Health VAA steps									
1.Frame and scope the assessment	X	X				X			
2.Vulnerability assessment	X	X				X			
3.Impact assessment	X	X				X			
a) How climate-sensitive health outcomes may change, irrespective of climate change	X	X				X			
b) Estimating possible additional burden of adverse health outcomes due to climate change.	X	X				X			
4.Adaptation assessment	X	X				X			
5. Monitoring and managing the health risks of climate change.									
Completed HNAP steps									
1. Align HNAP with NAP		X			X			X	
2. Take stock of information		X			X	X	X	X	
3. Identify approaches to address gaps		X			X	X	X	X	
4. Conduct a health VAA						X	X		
5. Establish health co-benefits									

Notes:

NAP process:

(A) Establish the institutional arrangements to launch the process, taking stock of available information on climate change impacts, vulnerability and adaptation and assessing gaps. Addressing capacity gaps and weaknesses in undertaking the NAP process and

(B) Analyzing current climate and future climate change scenarios and vulnerabilities and identifying adaptation options at alit also includes appraising adaptation options with the aim to mainstream climate change adaptation into national and subnational development and sectoral planning.

(C) Prioritize climate change adaptation in national planning and enhancing the needed capacity for planning and implementation.

(D) Monitor and review of the NAP process and its effectiveness.

Health VAA process:

(1) Establish a project team and management plan; establish a stakeholder process; define the geographical region and health outcomes of interest; identify the policy context for the assessment; develop a communications plan.

(2) Describing the current risks of climate-sensitive health outcomes, including the most vulnerable populations and regions; describing the current capacity of health and other sectors to address the risks of climate-sensitive health outcomes.

(3) Identify and prioritize policies and programmes to address current and projected health risks from climate change.

HNAP process:

(1) With help of formal institutional arrangements.

(2) Identify national and subnational research on the health risks of climate variability and change; knowledge of factors increasing/decreasing vulnerability; adaption policies and programmes undertaken; and national and regional capacity gaps to undertaking the HNAP.

(3) Essentially based on a 'SWOT' analysis of the results of Step 2.

(4) Analyse current climate and future climate change scenarios; assess climate vulnerabilities and identify adaptation options; and review and appraise adaptation options.

(5) Review implications of health-related climate change on goals, legislation, strategies, policies and plans, whereby, in coordination with health-determining sectors.

Annex 3

Group work simulation exercise for developing HNAPs

A health and climate vulnerability assessment report of a fictitious country called Patoka was circulated to participants one day in advance for them to read and understand the situation. The participants were divided into three groups and asked to analyze the information given in the case study and to prepare an adaptation plan for addressing impacts of climate change on the people of Patoka. The objective of the exercise was to expose participants to the process and the analyses that are needed for developing HNAP.

Patoka is a Asia Pacific country with low, flat and central alluvial plain surrounded by two rivers and has the following characteristics: Temp .7-.9 c (2030) and 1.3-2 c (2050); Sea level rise 3.1 mm per year; Extreme weather events; Increased urbanization; Low Accessibility and utilization level (OPP high); 34% are living on less than 1 $ per day; 34% under 15 years of age and 6.4% over 60 years.

The groups developed adaptation plan for Patoka using the following questions. Each group presented their group work reports. The group results are summarised below.

- Assess current health issues and health programs of Patoka
- Identify vulnerability and climate hazard experienced by the country
- Identify priority climate sensitive health outcomes
- Assess if current health programmes are sufficient to address the additional risk posed by climate change
- Suggest measures for adaptation to address the additional risks
- Draft a Monitoring, Evaluation and Learning framework (can be just dot points/skeleton structure)

Group 1

Current health issues	• 77 districts, 74 hospitals • Low accessibility and utilization of healthcare services (OPP high) • Health indicators are lower than neighboring countries • High maternal and child mortality • LE is 48 years (low) • 85% of OPP • National Environment health action plan (NEHAP 2009-2015)
Vulnerability and climate hazard	• Dengue • Malaria • Flood/droughts/storms (food insecurity) • Malnutrition • Low sanitation • Low safe drinking water • Outbreaks of WBD and VBD • The most vulnerable areas are southeast and North of Patoka
Climate sensitive health outcomes	• Diarrheal (< 5 year 16% mortality) • Sanitation (rural 16%, urban 55%) • Drinking water (42% rural, 76% urban)
Current health programs	• Lack collaboration within the sectors • Inadequate Human Resources • Absence of Strategic planning
Measures for adaptation	• Leadership and governance • Capacity building • Vulnerability Assessment • Risk Monitoring • Research Mapping

	• Infrastructure • Environmental determinant • Climate informed interventions • Emergency Preparedness • Financing • Increase food security
Monitoring and evaluation	• Regular Surveillance of climate sensitive diseases • Research at least one baseline • Resource Mobilization • V & A report • HNAP prepared • Training module developed • Weather data available with HIS • Early warning System for vulnerable groups • % of stunted < 5 years children (ensure food security) • Out of Pocket expenditure goes down in 5 years time

Group 2

Current health issues	• Maternal and child health – high mortality • High under nutrition • Vector borne diseases – Dengue, Malaria • Food and water borne diseases • NCDs including mental health • Health consequences of extreme weather events
Health program	• Heath Strategic Plan 2008-2015 • Reproductive, maternal, newborn and child health • Communicable diseases: Dengue control program Malaria Control program • Non-communicable diseases

	• National Environment Health Action plan 2009-2015 • Climate change is one of 7 thematic working groups
Vulnerability and climate hazards	• Temperature rise: 0.7-0.9 C in next 20 years, 1.3-2 C by 2050 • Changes in precipitation- projections are complex • Extreme weather events • Sea level rise
Vulnerable groups	• Women and children • Urban poor • People living in low-lying and coastal areas • People engaged in Informal sector
Priority climate sensitive health outcomes	• Dengue, Malaria • Water and food borne diseases • Under nutrition • Mental health issues due to sea level rise and extreme weather events
Current health programs	• Current programs not adequate, • Can manage in terms of VBDs • Requires a strong program on food security and under nutrition • Identify a focal point from MOH for CC • Food borne and water borne disease control programs needs strengthening • Requires strong mechanism to manage extreme weather events • Need to establish mechanism for training and capacity development in CC area • Requires a strong program for disaster preparedness and response including hospital preparedness • Strengthen MCH program to reduce mortality (to cater additional risks posed by under nutrition) • Strengthen immunization program • Implement strong health promotion programs • Strengthen mental health and NCD programs

Adaptation options	• Assess & prepare for health risks due to vector borne, pathogenic diseases, food borne diseases • Assess and prepare for managing nutritional issues • Minimize health hazards associated with incidence of extreme weather events • Assess the impact on health due to increased temperature
Monitoring and evaluation framework	• Input indicators – HR, finance, logistics • Process indicators • Designated unit established at MOH • Number of people received training on CC and health • Number of coordination meetings held • Output indicators • Number of researches conducted on CC and health • Outcome indicators • Incidence and case fatality rate of Malaria, Dengue • Percentage of wasting, stunting, underweight among children under 5 years • Low birth weight • Mortality rate – MMR, NMR, U5MR

Group 3

Current health issue and health program	• Reproductive, maternal, newborn and child health, • Communicable diseases, • Non communicable diseases • Limited health infrastructure and resources • High health cost financing
Vulnerability and climate hazard	• High poverty (poor country) • Low education level • Limited technology & infrastructure • Governance

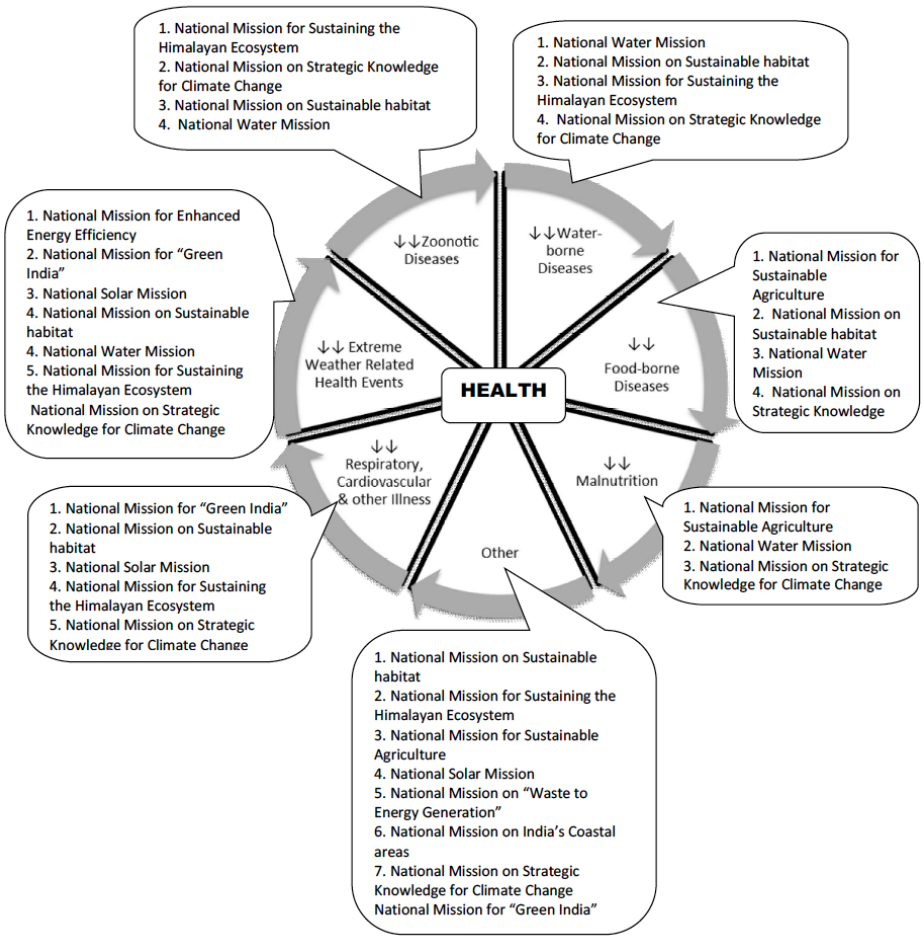
	• Densely populated : 40 million inhabitants • Settlement close proximity to river systems • Agrarian society • Flood • Drought • Sea level rise
Priority climate sensitive health outcomes	• Vector borne disease (malaria, dengue fever) • Food security (malnutrition) • Health effects from extreme weather events • Water and food borne disease (diarrhoeal)
Current health program sufficient to address the risk posed by climate change	• Dengue Fever - Adequate • Effective disease and Vector surveillance • Community based dengue control • Case management and outbreak containment programme • COMBI (Communication for Behavioural Impact) • Malaria • Weak surveillance (Under reporting at national programme)
Adaptation measures to address additional risks	**Malaria** • Strengthen vector surveillance • Build capacity on case management and diagnosis of malaria in malaria free zone • Strengthen reporting system **Food Security** • No current intervention mentioned • Work closely with agriculture sector: – improve technology – malnutrition surveillance – fortification and vitamin supplement – drought resistant crop (rice)

	Extreme Weather Events • No current intervention mentioned • Develop early Warning System especially for flood • Emergency Preparedness and Management • Water and Food Borne Diseases • Improve access to drinking water • Provide adequate sanitation • Drainage and storm water management
Monitoring and evaluation	Set target and indicators for all underlying environmental determinants of health

Annex 4

Example of cross-sectoral coordination to rationalize public health and climate change relationships in all relevant sectors, India 2006 (draft not for circulation)

IV. INTEGRATION OF HEALTH MISSION WITH OTHER NATIONAL MISSIONS ON CLIMATE CHANGE



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Annex 5

Assessment of health and climate management in European countries

Assessment of health and climate management in European countries

The WHO Regional Office for Europe's work in partnership with engaged individuals and stakeholders in ministries of health and the environment has been crucial for the advancement on protecting health from climate change. To assess the current status of Member States' activities to mitigate or adapt to the health effects of climate change, identifying gaps in knowledge and capacity, share experiences and information on best practice in developing and implementing effective adaptation and mitigation measures to increase the effectiveness of health adaptation strategies, a questionnaire was developed and completed by 22 country respondents[71]. The issues addressed were grouped under the following categories: 1 Governance; 2 Vulnerability, impact and adaptation assessments; 3 National and subnational adaptation strategies; 4 Climate change mitigation; 5 Strengthening health systems; 6 Raising awareness and building capacity; 7 Green health services; 8 Sharing best practice.

From the results, several areas for technical improvement were identified, especially an overall strengthening of capacities for assessment of health related mitigation benefits; ascertainment of climate-sensitive disease burden in populations; assessment of the adequacy of adaptation and its social, environmental and economic consequences; and development of climate change health and risk communication principles and materials. Specific points:

- Financial and human resources for climate change health adaptation need to account for the additional burden of health impacts brought about by climate change.

[71] http://www.euro.who.int/__data/assets/pdf_file/0009/91098/E81923.pdf

- Key areas like the economic consequences of inaction in climate policy are still rarely included in vulnerability, impact and adaptation assessment materials and communications.
- Important areas remain lacking, however, such as the development of integrated climate, environment and health surveillance or building climate resilient health infrastructures.
- There is a high level of awareness about climate change in the responding countries, yet awareness of its health implications is lower.
- Most countries reported activities focusing on the "greening" of health services.

Questions to assess the current status of Member States' activities to mitigate or adapt to the health effects of climate change:

1. Governance:

1.1 Who is in charge of climate change in your country? (Establishment of an office with a focal point, terms of reference, technical/advisory/expert committees/ working groups, skilled staff and funds?)

1.2 Who is in charge of the health aspects of climate change? (Establishment of research/knowledge management unit in the office for climate change and health?)

1.3 Has a multisectoral committee been established to deal with climate change? (Establishment of an intersectoral collaborative mechanism for deriving co-benefits; (ii) links between biological and environmental risk and impact data?)

1.4 Have you identified human and economic resources (for example, Establishment of data base and list of experts, ensured that a national steering group is in place and has responsibility for identifying resources, provides strategic oversight and the delivery and monitoring of the strategy)? (Development of tools to assess and monitor vulnerability and adaptation skills, and their periodic updating; Development of capacity to predict future risks, climate change scenarios and impacts?)

2. Vulnerability, impact and adaptation assessments

2.1 Have you carried out a national assessment of climate change impact, vulnerability and adaptation in your country? (1. Incidence of climate sensitive diseases 2. Development of vulnerability index based mapping 3. Generated knowledge is used for planning adaptation?)

2.2 Have you done a national (or regional) health impact, vulnerability and adaptation assessment of climate change in your country?

3. National and subnational adaptation strategies

3.1 Have you developed a national adaptation strategy to climate change in your country? (If yes, has it been approved by your government?). (Development of a hazard map by type, magnitude, location and population characteristics, and its periodic updating; Establishment of an effective surveillance, monitoring, review, supervisory and feedback mechanism; Conduction of forum for information exchange?)

3.2a Have you developed a national climate change health adaptation strategy or health action plan?

3.2b Have you developed a national adaptation strategy to climate change in your country? (If yes, has it been approved by your government?).

4. Climate change mitigation

4.1 Do you promote energy-efficient buildings? (Effective and efficient transfer of technology including measurement of the carbon footprint of health facilities and capacity to predict future vulnerabilities; Periodic assessment of the carbon footprint of the health facilities?).

4.2 Do you promote access to safe transport or public transport modes?

4.3 Do you promote carbon-neutral agriculture practices?

4.4 Have you assessed the health benefits of the above measures?

4.5 Have mitigation measures in other sectors in your country been taken?

4.6 If mitigation measures in other sectors have been taken, have any health effects of those mitigation measures been assessed? (Study of existing plans and initiatives of the health and other sectors, and development partners for co-benefits and conduction of other required research work?)

5. Strengthening health systems

5.1 Have you strengthened public health and health services to cope with climate change? (If yes, please provide examples…) (Development of capacity for intersectoral leadership and global negotiating capacity (of health sector professionals, managers and policymakers?)

5.2 Have you enhanced disease surveillance and early warning of climate sensitive diseases? (If yes, for what diseases? What exactly has been done?)

5.3 Have you developed early warning systems for extreme weather events and have you developed appropriate health sector response plans in the areas below (heat waves, fires, droughts, cold waves, flooding, air quality?).

5.4 Have you strengthened health sector engagement in emergency planning for extreme weather events and have you developed cross-sector plans (heat waves, fires, droughts, cold waves, flooding, air quality?).

5.5 Have you improved monitoring of climate sensitive environmental determinants of health?

5.6 Have you developed a cross-sector approach on climate change adaptation?

5.7 Do you intend to address health benefits/damage (e.g. by conducting a health impact assessment)?

6. Raising awareness and building capacity

6.1 Is climate change perceived as important in political developments in your country?

6.2 Are health effects of climate change of high relevance in political processes? (Development and enactment of effective and relevant policies, regulations, strategies and plans?)

6.3a Is the level of support for policies targeting climate change and related effects on health high in the public sector of society?

6.3b Is the level of support for policies targeting climate change and related effects on health high in the private sector of society?

6.4 Do you have enough information at your disposal on climate change and its impact on health with regard to your country?

6.5 Have you built capacity and developed a workforce on climate change and health-related aspects?

6.6 Have you raised public awareness about climate change and health and mitigation and adaptation measures? (Advocacy to the public, policymakers, managers, other sectors and donors for adequate resources and functional support; Awareness building of the people, public leaders, managers in health and other sectors for efficient adaptation and mitigation in domestic, corporate and health-care settings, (ii) provision of training and logistics; Inclusion of climate change, health and nutrition related topics in institutional curricula at different levels).

6.7 Have you developed communication messages for extreme weather events to be released with an early warning for such an event?

6.8 Have you developed communication plans for key messages on climate change and health for other sectors and the general public?

6.9 What are the main messages on protecting health from climate change you would like to communicate?

7 Green health services

7.1 Greening health services: please report on activities at the national, regional or local levels that have been undertaken to reduce the health sectors' own greenhouse gas emissions.

7.2a Can you list a few examples of measures that have been taken?

7.2b Have local measures in any health care facilities been taken, like training and organizing the workforce? (i) Disaster proofing of the health facilities (ii) Capacity to manage climate sensitive health outcomes

7.2c Has the effectiveness of some of the measures or action on sustainable health been evaluated?

8. Sharing best practices.

8.1 Can you share information on best practice with regard to: national health impact assessments; adaptation plans and strategy developments; trends in climate change, environment and health indicators; case studies of best practices and health co-benefits; pilot project funding and research opportunities; effectiveness of adaptation and mitigation measures.

8.2 Have you developed projects or aspects related to innovation and research?

8.3 Evaluation of health damage and adaption costs: have you estimated the costs of climate change and/or the health damage costs?

8.4 Do you measure and evaluate trends in climate change, environment and health indicators?

8.5 What do you measure? And to whom do you report: exposure to heat-waves; excess heat mortality; policies to prevent heat-related deaths; exposure to allergenic pollen; population exposure to floods; policies to prevent infectious diseases; waterborne diseases; foodborne diseases?

8.6 Are you aware of pilot projects in your country on climate change and health? (If so, please list some of them.)

8.7 Which of the results would you promote to share with other Member States?

The report on development of health national adaptation plan for climate change in South-East Asia report is prepared primarily based on the information presented at the WHO training on development of Health National Adaptation Plan for climate change held in Kathmandu, Nepal from 16-18 November 2016. The training was attended by focal points of climate change and health, Ministry of Health of Bangladesh, Bhutan, India, Indonesia, Maldives, Nepal, Sri Lanka, Thailand and Timor-Leste. The report provides a summary of the process of developing a national health adaptation plan, its importance and status of HNAPs in these countries.

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