



**MINISTRY OF HEALTH**

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**NATIONAL CLIMATE CHANGE ACTION PLAN FOR PUBLIC HEALTH  
2014-2018**

Climate Change Technical Working Group for Health  
January 2014

## Executive Summary

The National Climate Change Action Plan for Public Health (NCCAPPH) provides a set of specific actions and measures in response to the growing climate change risks and impacts on the public health of the Cambodian population. Following the adoption of the Cambodia Climate Change Strategic Plan and Sector and Climate Change Strategic Plan for Public Health, the NCCAPPH is prepared in conformity with the government guidelines supplemented by additional climate change planning methods and guidelines of regional and international best practice such as of IPCC, WHO, ADB ...etc., including reports and publication on climate change sensitive diseases and related health implications experienced in other countries. This volume consists of six main chapters describing key findings of analysis, consultation and planning process.

The NSDP and the HSSP2 set out three goals to address a number of health issues, of most climate relevance is the goal “to reduce morbidity and mortality of HIV/AIDS, Malaria, Tuberculosis, and other communicable diseases; and to reduce the burden of non-communicable diseases and other health problems”. The CCCSP also incorporates health issues and response in its strategic objectives. Despite good policy and strategies, Cambodia public health remains increasingly vulnerable to climate change risk, especially to the abnormal change of climate variability. There is ample evidence of past and present health burden caused by climate change events such as floods, droughts, and storms. Flooding in 2000 was the most severe flooding ever happening in Cambodia affecting million people, causing human death (347, 80% of which were children), and damaging social and physical infrastructure (US\$150 million). High rainfall and flood favor proliferation of vector borne diseases such as malaria and dengue, which can become serious problems for rural population especially in the remote areas with poor health facility and service, and lack of prevention measures. Water borne and food borne diseases are projected to have effects on health as a result of climate change. The health statistics of the MOH has revealed an alarming number of water-borne diseases contracting cases, which is accounted for about 47 cases per 1000 population, where 41% of all patients were children with age below 4 years.

Based on above situation analysis three priority and corresponding strategies are identified, namely: the risk of transmission of vector-borne diseases to human being due to increased precipitation, humidity, and floods; increased vulnerability to water/food borne diseases as a result of poor sanitation and deteriorated water quality during floods, droughts and rising temperature; and Health outcomes and food insecurity resulted from extreme weathers such as prolong floods, droughts, and intensive storm surges.

In response to these priority health issues arising from climate change strategies and actions are devised as the following:

**Strategy 1:** to increase resilience capacity of the population in combating vector-borne and water borne diseases arising from climate change

- Development and update of technical guidelines for diagnosis, detection, control, prevention and treatment of vector borne and water borne diseases, injuries and other food poisoning illness arising from climate change;
- Up-scaling Communicable Disease Control across the country, including conducting surveillance and research on malaria and dengue fever in the context of climate change;
- Development and Implementation of Dengue Control Program in provinces with high climate change risk;

- Up-scaling Malaria Control Program to contain artemisinin-resistance *Plasmodium falciparum* parasites and moving toward malaria pre-elimination status in Cambodia;
- Up-scaling of National program on acute respiratory infection, diarrhea disease and cholera in disaster prone-areas, including conducting surveillance and research on water-borne and food borne diseases associated with climate variables.

**Strategy 2:** to reduce impacts of extreme weathers and disasters through better emergency preparedness and response plans

- Development and implementation of data collection system on health outcomes arising from natural disasters and other man-made disasters, taking into consideration gender impacts, in synergy or collaboration with the Cambodia Red Cross, NCDM, MOWRAM and other relevant agencies;
- Strengthening emergency preparedness and responsive network and plans, including food safety response, at all levels.

**Strategy 3:** to build knowledge of the population and health personnel to cope with climate change impacts

- Updating Health Database with inclusion of climate change variables and associated diseases;
- Organizing trainings on health impact/vulnerability assessment, modeling of climate variability and health impacts, surveillance and research based on training need assessment in collaboration with CCCD of the MOE, WHO and other relevant health institutes such as Pasteur;
- Promoting public education and awareness campaign with a focus on women through different means on health impacts of climate change, including disease control, prevention, treatment, epidemic preparedness, nutrition and sanitation and hygiene;
- Capacity development for mainstreaming climate change in annual operation plans of Special Operating Agencies (SOA) as part of the Service Delivery Grant (Pool Funding Modality).

The benefits of NCCAPPH will be reduced risks and impacts of climate change on public health, improved knowledge and information through better surveillance, research and awareness raising, reduced vector borne and water borne incidents and case fatality among the population in the areas of climate change risks and disasters, and improved capacity of the health personnel in delivery of quality services in the context of climate change. Based on the WHO's cost of saving of one DALY<sup>1</sup> at less than three times the per capita GDP, and if the Climate Change Action Plan matched the WHO's estimate, then the expenditure of \$46.8m over five years would save about 15,000 DALYs.

The total budget for implementation of NCCAPPH over five years is estimated at US\$46.8 million. Malaria remains high priority in the context of climate change with a top-up of about 30% of the budget allocation in 2013. Budget for disaster preparedness and emergency response will support a mix of actions, including water-borne and food borne diseases that become serious health burden during disasters.

Climate Finance in the health sector is expected to come from two major sources: i) increased climate change relevance of health expenditure, through better informed planning and budgeting of the national budget, pooled fund, and projects under HSSP2; and ii) mobilization of dedicated climate finance from multilateral funds, bilateral donors, and Government. Pool funding is most important tool for mobilizing funding from multilateral donors to support implementation of HSSP2, which can be further explored and expanded to

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<sup>1</sup> Disability Adjusted Life Year



cover the cost for implementation of NCCAPPH. Budget Strategic Plan for 2014-16 indicates an increase of budget allocation from both government and donors, where in 2014 about 20% of overall budget is allocated for Climate Change related programs (Communicable Diseases Control, not including water borne and food borne diseases), which provides a good trend of funding allocation for budget planning for NCCAPPH.

A set of health core indicators has been adopted by HSSP2 and integrated in the NSDP, some of which are of climate change relevance, which would be the entry points for Monitoring and Evaluation (M&E) for climate change (CC). Additional core indicators can be proposed to reflect the expected outcomes of (Sector Climate Change Strategic Plan) SCCSP and NCCAPPH. In addition the result based indicators are also developed for each action which can provide added information to measure the success of the NCCAPPH.

The NCCAPPH will indeed become routine planning, budgeting and M&E procedures of the MOH, building on the success of HSSP2. The Climate Change Working Group for Health will play a central role in coordinating and implementing NCCAPPH and related actions or projects/ programs with relevant departments within the MOH as well as with other relevant ministries.

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## Abbreviation

|         |  |
|---------|--|
| ADB     | Asian Development Bank   |
| CCCA    | Cambodia Climate Change Alliance                                 |
| CCD     | Climate Change Department  |
| CCCSP   | Cambodia Climate Change Strategic Plan                           |
| CCSPH   | Climate Change Strategic Plan for Public Health                  |
| CDC     | Communicable Diseases Control                                    |
| CMDGs   | Cambodian Millennium Development Goals                           |
| CNM     | National Center for Parasitology, Entomology and Malaria Control |
| CRC     | Cambodian Red Cross  |
| CRS     | Cambodia Rectangular Strategy                                    |
| DDF     | Department of Drugs and Food                                     |
| DPHI    | Department of Planning and Health Information                    |
| GDP     | Gross Domestic Product   |
| HIS     | Health Information System  |
| HSSP2   | Health Strategic Plan Phase 2                                    |
| INC     | Initial National Communication                                   |
| IPCC    | Inter-governmental Panel for Climate Change                      |
| MOE     | Ministry of Environment  |
| MEF     | Ministry of Economic and Finance                                 |
| MOH     | Ministry of Health   |
| MOP     | Ministry of Planning   |
| MOWRAM  | Ministry of Water Resources and Meteorology                      |
| NAPA    | National Adaptation Program of Action to Climate Change          |
| NCCAPPH | National Climate Change Action Plan for Public Health            |
| NCDM    | National Committee for Disaster Management                       |
| NMCHC   | National Maternal and Child Health Care                          |
| NSDP    | National Strategic Development Plan                              |
| PHD     | Provincial Health Department                                     |
| PMD     | Preventive Medicine Department                                   |
| SNC     | Second National Communication                                    |
| SOA     | Special Operational Agency                                       |
| UNICEF  | United Nations Children's Fund                                   |
| UNDP    | United Nations Development Program                               |
| UNFCCC  | United Nations Framework Convention for Climate Change           |
| USAID   | U.S. Agency for International Development                        |
| WHO     | World Health Organization  |



## I. Background

The National Climate Change Action Plan for Public Health (NCCAPPH) is developed following the recent adoption of the Cambodia Climate Change Strategic Plan (CCCSP) and the Sector Climate Change Strategic Plan (SCCSP) for Public Health. It is prepared in response to the growing climate change risks and impacts on the public health of the Cambodian population. The MOH is one of the nine ministries selected to undertake preparation of NCCAPPH with the technical and financial support from the Cambodia Climate Change Alliance (CCCA) and Climate Change Department (CCD) of MOE. The Climate Change Working Group for Health plays a leading role in development of NCCAPPH in coordination and consultation with stakeholders concerned. The NCCAPPH provides a broad framework for achieving the goals of CCCSP and SCCSP through implementation of specific actions or programs in synergy with existing sector strategy such as HSSP2. The expected benefits of NCCAPPH would be better health outcomes for all Cambodian people in the context of climate change.

### a. Policy and strategies

Improved health outcomes are the cross-cutting goals of many government strategies and policies, namely The Rectangular Strategy (RS), National Strategic Development Plan (NSDP), the Health Strategic Plan, The Cambodia Millennium Development Goals (CMDG) and the recently adopted CCCSP. Improvement of health care services is identified as one of the target areas under Growth Rectangular 4 “Capacity Building and Human Resource Development” of the RS. The NSDP and the HSSP2 set out three goals to address a number of health issues, namely to reduce newborn, child and maternal morbidity and mortality with increased reproductive health; to reduce morbidity and mortality of HIV/AIDS, Malaria, Tuberculosis, and other communicable diseases; and to reduce the burden of non-communicable diseases and other health problems. Among nine CMDGs, Goal 4 (reduce child mortality); Goal 5 (improve maternal health); and Goal 6 (combat HIV, Malaria and other diseases) have made significant progress against its indicator framework but this achievement can be impeded by climate change impacts. The Strategic National Action Plan on Disaster Risk Reduction (SNAP\_DR) also identifies health issues an important part of the Disaster Risk Reduction and proposes for the assessment of hospitals that are located in hazard-prone areas, analysis of vulnerability of health facilities to these hazards, and development and implementation of hospital preparedness plan for all health facilities.

The CCCSP comprises eight interrelated objectives designed to address adaptation and mitigation in some key sectors, though it does not specify specific objective on health, the overall achievement of the goal and objectives of CCCSP will contribute to health outcomes, for example, as a result of improved food, water and energy security, improved knowledge and awareness on climate change, and capacity building.

### b. Situation

Climate change has direct and indirect impact on human health. Evidence of past and present climate change impacts on health has been increasingly observed though limited time series data on climate variables and climate sensitive diseases remains a big gap. Extreme weathers such as intensive storm surge like Ketsana can directly cause human death, injuries, morbidity, and mental problems<sup>2</sup>. According to NCDM, flooding has

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<sup>2</sup> Typhoon Ketsana affected 50,000 families, leaving 43 people dead and 67 severely injured (NCDM, 2010).

|  |   |  |  |  |      |      |      |      |      |        |
|--|---|--|--|--|------|------|------|------|------|--------|
|  | 5 | <i>Up-scaling of National program on acute respiratory infection, diarrhea disease and cholera in disaster prone-areas, including conducting surveillance and research on water-borne and food borne diseases associated with climate variables.</i>   |  |  | 100  | 100  | 200  | 200  | 200  | 800    |
|  |   | <b>Strategy 2:</b> <i>to reduce impacts of extreme weathers and disasters through better emergency preparedness plans and response</i>   |  |  |      |      |      |      |      |        |
|  | 6 | <i>Development and implementation of data collection system on health outcomes arising from natural disasters and other man-made disasters, taking into consideration gender impacts, in synergy or collaboration with the Cambodia Red Cross, NCDM, MOWRAM and other relevant agencies;</i> |  |  | 50   | 50   | 50   | 50   | 50   | 250    |
|  | 7 | <i>Strengthening emergency preparedness and responsive network and plans, including food safety response, at all levels.</i>   |  |  | 1000 | 2000 | 3000 | 3000 | 1000 | 10,000 |
|  |   | <b>Strategy 3:</b> <i>to build knowledge of the population and health personnel to cope with climate change impacts;</i>   |  |  |      |      |      |      |      |        |
|  | 8 | <i>Updating Health Database with inclusion of climate change variables and associated diseases;</i>  |  |  | 50   | 50   | 50   | 50   | 50   | 250    |
|  | 9 | <i>Organizing trainings on health impact/vulnerability assessment, modeling of climate variability and health impacts, surveillance and research based on training need assessment in collaboration with CCCD of the MOE, WHO and other relevant health institutes such as Pasteur;</i>      |  |  | 300  | 300  | 300  | 300  | 300  | 1,500  |



|    |   |        |        |        |        |        |        |
|----|---|--------|--------|--------|--------|--------|--------|
| 10 | Promoting public education and awareness campaign with a focus on women through different means on health impacts of climate change, including disease control, prevention, treatment, epidemic preparedness, nutrition and sanitation and hygiene; | 200    | 200    | 200    | 200    | 200    | 1,000  |
| 11 | Capacity development for mainstreaming climate change in annual operation plans of Special Operating Agencies (SOA) as part of the Service Delivery Grant (Pool Funding Modality).  | 50     | 50     | 50     | 50     | 50     | 250    |
|    | Grand Total   | 11,900 | 11,950 | 11,900 | 11,700 | 11,700 | 46,800 |
|    | Ceiling   | 9,000  | 9,000  | 1,000  | 10,000 | 11,000 | 49,000 |

c. Implications for Expenditure in the Ministry

The budget planning and allocation<sup>3</sup> of MOH is based on Sector Wide Management Framework (SWiM) which was adopted by MOH in 2000 (HSP 2008-15). The funding mechanism for SWiM consists of government recurrent and capital budget, pool funding and various donor contributions. A positive outlook for the health sector is that expenditure from the government budget for all health programs has an increase in an average of 20 % per annum between 2008 and 2012, though the rate of expenditure increase was relatively less at the sub-national level (table 3). The total budget of National Climate Change Action Plan for Public Health (NCCAPPH) is US\$ 46.8 million, or about US\$ 9.4 million per annum, which represents an increase of around 3.3% and 33% compared respectively to the total health funding and the budget for malaria control program as of 2014 (assuming that 50% of the total budget for all communicable diseases control is expended by Malaria).

Table 3: Trend in Public Expenditure of MOH 2008-2012 (Million Riel).

| Whole Sector              | 2008      | 2009      | 2010      | 2011      | 2012      |
|---------------------------|-----------|-----------|-----------|-----------|-----------|
| Recurrent                 | 426,790.3 | 524,146.3 | 615,375.3 | 655,098.9 | 759,206.6 |
| % of increase             | -         | 22.81     | 17.40     | 6.45      | 15.89     |
| Central Level             | 2008      | 2009      | 2010      | 2011      | 2012      |
| Recurrent                 | 302,382.9 | 368,083.8 | 445,469.3 | 460,695.4 | 563,578.6 |
| % of increase             | -         | 21.72     | 21.02     | 3.41      | 22.33     |
| Province and municipality | 2008      | 2009      | 2010      | 2011      | 2012      |
| Recurrent                 | 124,407.3 | 156,062.5 | 169,905.9 | 194,403.6 | 195,628.0 |
| % of increase             |           | 25.44     | 8.87      | 14.41     | 0.63      |

Source: Budget Strategic Plan 2014 of MOH

<sup>3</sup>An increasing level of recurrent government spending for health, reaching 12% of national budget, although remaining a low share of GDP at little more than 1% in 2007 (HSP 2008). A very high level of private, out-of-pocket (OOP) household spending that accounts for approximately two-thirds of all health expenditure, donor funding contributes about US\$ 7 per capita in year 2007.

financing, on the basis of the IPCC finding that floods, droughts and other extreme weather events could double by 2050, due to climate change.

As this is the first Climate Change Action Plan for the Ministry of Health, several of the proposed actions are focused on building adequate capacity for planning, surveillance/monitoring and analysis of climate change impacts on health in Cambodia. These dedicated actions should be 100% funded through climate finance, and be integrated in existing planning, training, awareness-raising and M&E activities under HSSP2.

Climate Finance in the health sector is expected to come from two major sources: i) increased climate change relevance of health expenditure, through better informed planning and budgeting of the national budget, pooled fund, and projects under HSSP2; and ii) mobilization of dedicated climate finance from multilateral funds, bilateral donors, and Government. Dedicated climate funds should preferably come as budget support (through Government) or as a top-up for pooled funding, as these mechanisms provide flexibility to allocate resources based on the annual work planning undertaken under HSSP2. When donors or funds are not able to pool funds or provide budget support, specific projects could be developed (or a climate change component added to existing projects) under the overall HSSP2 framework. A technical assistance project may be developed grouping the various actions required to develop national capacities to plan, monitor and implement the climate change response in the health sector.

Table 4: Trend in Budget Plan 2014-2016 (million riels)

| Strategy/<br>Programme                                | Budget Law 2013 |           | 2014     |           | 2015     |           | 2016      |           |
|---|-----------------|-----------|----------|-----------|----------|-----------|-----------|-----------|
|   | Govern.         | Ext. fund | Govern.  | Ext. fund | Govern   | Extern.   | Govern    | Ext. fund |
| Grand Total   | 697,148         | 253,357   | 799,314  | 338552    | 962811   | 311,438   | 1,040,420 | 217,026   |
| Total recurrent                                       | 649,738         | -         | 748,981  |           | 861775.5 |           | 991690.8  |           |
| Personnel   | 31,092          |           | 36688    |           | 44026.3  |           | 52831.5   |           |
| Operation   | 618,646.3       |           | 712,293  |           | 817749.2 |           | 938859.3  |           |
| Total capital   | 47,410.2        | 253,357   | 50332.7  | 338552.2  | 101035.8 | 311438.1  | 48729.4   | 217.026   |
| Investment  | 23,113.8        | 158,809   | 24,415.1 | 201,162   | 51870    | 182767.6  | 34343.1   | 195484    |
| TA  | 24296.4         | 94,548.5  | 25917.6  | 137390.2  | 49165.8  | 128670.5  | 14386.3   | 21,542.6  |
| Communicable<br>disease program<br>(TB, HIV, malaria) | 26,394.6        | 152,584   | 28115.4  | 200,194   | 56257.3  | 181,617.4 | 38149.3   | 192,208   |
| Recurrent   | 4913            |           | 5502.6   |           | 6217.9   |           | 7026.2    |           |
| Total capital   | 21481.6         | 152584.1  | 22,612.8 | 200,194   | 50039.4  | 181617.4  | 31123.1   | 192208    |
| Investment  | 2187            | 66,042.5  | 2187     | 72,646.5  | 6237     | 63180     | 18832.4   | 172680.9  |
| TA  | 19,294.6        | 86,541.6  | 20425.8  | 127,547.5 | 43,802.4 | 118,437.  | 12,290.7  | 19,527.1  |
| % of funding CC<br>related program                    | 3.78            | 60.22     | 3.51     | 59.13     | 5.84     | 58.31     | 3.66      | 88.56     |

Source: Budget Strategic Plan 2014-16 of MOH

c. Entry points for climate change mainstreaming in management and financing mechanisms

Once the Health Climate Change Action Plan is approved by the minister, the Climate Change Working Group will play a key role in disseminating the plan and advocating with concerned departments. These departments have been involved in the formulation process and will implement specific actions corresponding to department's mandate. The Department of Preventive Medicine through the Climate Change Working Group will play a coordination role in advocating, fund mobilization and implementation of actions.

At the planning stage, the key step is for CCAP actions to be reflected in the annual Operational Plan exercise, which start in April for the following year. Individual departments are responsible for this and Climate Change Working Group members can provide support. Budgets then need to be identified from the national budget, pooled fund or individual project.

In order to raise the profile of the CCAP, it is planned to present it at a meeting of the Health Technical Working Group, immediately following its approval by the minister, in order to facilitate allocation of budgets from existing mechanisms. Continued advocacy and updates will be required in this forum, using evidence generated from monitoring systems.



## V. Monitoring and Evaluation

### a. Core indicators

A set of health core indicators has been adopted by HSSP2 and integrated in the NSDP, some of which are of climate change relevance, which would be the entry points for M&E for climate change. Additional core indicators can be proposed to reflect the expected outcomes of SCCSP and NCCAPPH. Collection and management of related data for these indicators are managed under the Department of Planning and Health Information and are reported on an annual basis. Since monitoring of health outcomes are cross-cutting issues for CMDG and NSDP, health statistics is also collected and maintained by the National Institute of Statistics (NIS) under the Ministry of Planning. A good example was the Demography and Health Survey conducted in 2010 jointly between the General Directorate for Health and NIS (funded by USAID, UNFPA, JICA and UNICEF), results of which were used for the update and mid-term review of CMDG, NSDP and other national strategies. This practice can be further strengthened for Monitoring and Evaluation of additional climate related indicators for health sector, provided that cost sharing and data collection are agreed and coordinated among both ministries. The Department of Planning and Health Information is responsible for consolidating all budget plans from all technical departments and should be given responsibility for M&E as well.

One particular new indicator is DALY, which is not included in the current M&E system of MOH. DALY is used by WHO for monitoring and evaluation of health programs, and it is widely used for cost benefit analysis of action and project. However, DALY is a more complex compared to other indicators which would require adequate capacity for data compilation and analysis. It would be further complicated in the context of climate change uncertainty and the averted loss of DALYs. The view of consultation workshop held on 10 January was that this indicator was difficult to implement, but proposed that capacity building and further study was needed before integration of DALY in the M&E system of MOH. Below is a set of core indicators adapted from the HSSP2 and NSDP as initial entry points for M&E related to climate change.

- Dengue incidence rate per 1000 population.
- Dengue mortality rate (%).
- Malaria incident rate per 1000 population Malaria mortality rate (%).
- % of houses in the target area vulnerable to malaria and dengue having at least one impregnated bed net per household or receiving insecticide spreading.
- Incidence rate of water and food-borne diseases (diarrhoea, cholera, dysentery...etc.) per 1000 population.

### b. Result Based Indicators by Action

A number of result based indicators are proposed in the action fiche as attached in the annex. These indicators are designed to measure specific results and outputs of each action and some of which can be integrated in the NSDP. These indicators should be reported as part of the mid-term review and final review of the NCCAPPH.

## **VI. Legal Requirement**

There is no legal requirement for implementation of this NCCAPPH, but to ensure climate change actions are integrated in the present and future health programs and actions, planning and budgeting procedures must include clauses guiding budget allocation for climate change activities. Senior decision makers who approve the budget plan should be aware of the health burden resulted from climate change and the budget adjustment to meet those challenges. Regarding pool funding, there may be a need for adjustment of Memorandum of Understanding (MOU) or Agreement among development partners and MOH so that budget planning and allocation for Special Operating Agencies (SOA) include items for CC activities.

## VII. Conclusion

The development of NCCAPPH is the first exercise ever conducted by the Climate Change Working Group with the technical guidance and support from CCCA and CCD of MOE. Building on the government efforts in combating climate change related diseases, especially the malaria and dengue control program carried out by the National Center for Parasitology, Entomology and Malaria Control, the NCCAPPH expands to cover other aspects of climate change sensitive diseases such as water-borne and food-borne diseases, disaster preparedness and response plan and to support capacity building, surveillance and knowledge generation as a basis for better planning and response. The NCCAPPH provides a comprehensive framework of priority actions to be addressed for the five years. The total budget for NCCAPPH is US\$46.8 million, which is about 3.3% of the total budget for all health programs based on a potential increase of funding of 10-20%. Possible source of funding include government recurrent budget, pool funding, Climate Adaptation Fund, Green Climate Fund, GEF, CCCA, and various bilateral donors such as USAID, UNICEF, and JICA. A set of climate change indicators is adapted to the existing M&E with a few additional indicators added. Additional actions may emerge during the course of implementation following a mid-term review of the NCCAPPH.



## ANNEX: ACTION FICHES

### Action Fiche No 1

|   |  |
|---|--|
| Action 1  | Development and update of technical guidelines for diagnosis, detection, control, prevention and treatment of vector-borne and water-borne diseases, injuries and other food poisoning illness arising from climate change.  |
| CCCSP and Sector CCSP Strategic Objective                         | This action can contribute to the Strategic Objective 2 “Reduce sectoral, regional and gender vulnerability to climate change impacts”, and Strategic Objective 5 “Improve capacities, knowledge and awareness for climate change response” under the CCCSP. It also responds to the Objective 1 “to improve health care infrastructure and capacity of health personnel to cope with vector-borne and water-borne diseases in the context of climate change” of the Sector Climate Change Strategic Plan of MoH.                                    |
| Rationale   | <p>This action links to the Health Strategic Plan<sup>2</sup> which was integrated in NSDP update 2014-2018. It also contributes to the overall achievement of Climate Change Strategic Plan for Public Health.</p> <p>This action would reduce climate change impacts and implications on public health by improving existing guidelines and practice for diagnosis, detection, control, prevention, and treatment of vector borne and water borne diseases.</p>  |
| Category of climate change action                                 | Cat 2 – Modified   |
| Type of action  | Adaptation   |
| Short description of the action and expected results and benefits | <p>Short description</p> <p>Activities include a review of the existing guidelines, holding consultation with local and international specialists, developing or updating the technical guidelines, and dissemination of improved guidelines and practice to medical personnel for application, administration and logistic arrangement.</p> <p>Improved skill of medical personnel (200-500 medical staff at national and sub-national levels) in combating climate change sensitive diseases such as malaria, dengue and water borne diseases.</p> |
| Cost effectiveness of the action                                  | The cost for updating the guidelines for prevention and treatment of climate change related diseases is minimal compared to the benefits received in terms of saving human life, avoiding contracting diseases, reducing Disability Adjusted Life Years (DALY) and reduce health expenditure and improve income as a result of good health.  |
| Preconditions needed for successful implementation                | <p>No legislation is required.</p> <p>Understanding of the relationship between climate change and diseases.</p>   |
| Indicator(s) of success   | Number of updated guidelines and practice introduced in the Cambodian health care system.  |

|                             |  |
|-----------------------------|--|
| Implementation arrangements | <p>Responsible department(s)</p> <p>The Department of Preventive Medicine would play a key role in cooperation with the National Center for Parasitology, Entomology and Malaria Control, Communicable Disease Control Department, National Center for Health Promotion, Hospital Services Department, and the Department of Drugs, Food and Cosmetics, National Maternal and Child Health Centre (NMCHC), National Institute for Public Health (NIPH).</p> <p>Other Government and external stakeholders involved in implementation</p> <p>World Health Organization.</p> |
| Estimated total cost        | US\$250, 000   |
| Possible funding sources    | Government budget, pooled funding, climate adaptation fund and WHO.  |
| Timeframe                   | Indicate the start and end year<br>2014-2018   |

Action Fiche No 2

|   |   |
|---|---|
| Action 2  | Up-scaling Communicable Disease Control across the country through conducting surveillance and research on malaria and dengue fever in the context of climate change, including other emerging and reemerging climate change related diseases.  |
| CCCSP and Sector CCSP Strategic Objective                         | This action can contribute to the Strategic Objective 2 “Reduce sectoral, regional and gender vulnerability to climate change impacts”, and Strategic Objective 5 “Improve capacities, knowledge and awareness for climate change response” under the CCCSP. It also responds to the Objective 1 “to improve health care infrastructure and capacity of health personnel to cope with vector-borne and water-borne diseases in the context of climate change” of the Sector Climate Change Strategic Plan of MoH.   |
| Rationale   | <p>This action links to the Health Strategic Plan2 which was integrated in NSDP update 2014-2018. It also contributes to the overall achievement of Climate Change Strategic Plan for Public Health and the government policy for full elimination of malaria by 2025.</p> <p>This action would improve knowledge and understanding on potential climate change impacts on public health by expanding communicable disease control program and setting up surveillance system in areas of high climate risks, which would result in better coping with climate sensitive diseases such as malaria and dengue fever.</p>   |
| Category of climate change action                                 | Cat 1 – up-scaling  |
| Type of action  | Adaptation  |
| Short description of the action and expected results and benefits | <p>Short description</p> <p>Activities may include a review of the existing climate related surveillance and researches, upgrading existing communicable control activities, planning the surveillance and research, and setting up the surveillance plan, including procurement of necessary equipment such as mobile weather stations, transportation, computers, laboratory kits, ...etc. and training of additional staff for conducting surveillance, administration and logistic arrangement.</p> <p>Expected results and benefits, including number of beneficiaries and type of impact on beneficiaries.</p> <p>This action can benefit vulnerable groups, especially in the rural areas of high malaria and dengue incidents, by expanding and improving communicable control programs and better surveillance of climate change and related diseases.</p> |
| Cost effectiveness of the action                                  | Improved communicable diseases control program and better understanding of the relationship between climate change variables and diseases would result better health of the rural people and the poor, reduced number of DALYs, and family saving.  |



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| Preconditions needed for successful implementation | <p>No legislation and study required, it is an extension of on-going program.</p> <p>Coordination among national, sub-national level administrations (SOA), and participation of villagers.</p> <p>Capacity for surveillance, research and data analysis of climate variability and its relationship with disease propagation and outbreak is required.</p>  |
| Indicator(s) of success                            | Number of surveillance activities and researches are operational with inclusion of climate variables.  |
| Implementation arrangements                        | <p>Responsible department(s)<br/>Department of Preventive Medicine, the National Center for Parasitology, Entomology and Malaria Control, National Institute of Public Health, University of Health Science, Department of Hospital Services and Communicable Disease Control Department.</p> <p>Other Government and external stakeholders involved in implementation</p> <p>WHO, NGOs, IPC, and MOE.</p> |
| Estimated total cost                               | USD 1,000, 000   |
| Possible funding sources                           | Potential funding include pooled funding, government budget, bilateral donors (WHO, USAID), and climate adaptation fund.   |
| Timeframe  | Indicate the start and end year<br>2014-2018   |

Action Fiche No 3

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| Action 3  | Development and Implementation of Dengue Control Program in provinces with high climate change risk.  |
| CCCSP and Sector CCSP Strategic Objective                         | This action can contribute to the Strategic Objective 2 "Reduce sectoral, regional and gender vulnerability to climate change impacts", and Strategic Objective 5 "Improve capacities, knowledge and awareness for climate change response" under the CCCSP. It also responds to the Objective 1 "to improve health care infrastructure and capacity of health personnel to cope with vector-borne and water-borne diseases in the context of climate change" of the Sector Climate Change Strategic Plan of MoH. |
| Rationale   | <p>This action links to the Health Strategic Plan<sup>2</sup> which was integrated in NSDP update 2014-2018. It also contributes to the overall achievement of Climate Change Strategic Plan for Public Health.</p> <p>This action would improve knowledge and understanding on potential climate change impacts on public health by expanding dengue control program in areas of high climate risks, which would result in better coping with dengue fever.</p>  |
| Category of climate change action                                 | Cat 2 – Modified  |
| Type of action  | Adaptation  |
| Short description of the action and expected results and benefits | <p>Short description</p> <p>Procurement of insecticide and larvicide and spraying equipment, planning field missions and transport, administration and logistic arrangement.</p> <p>Expected results and benefits, including number of beneficiaries and type of impact on beneficiaries</p> <p>This action would further reduce dengue fever contracting cases.</p>  |
| Cost effectiveness of the action                                  | <p>Where possible, an estimate of the benefit cost ratio of adaptation actions and the marginal abatement cost of mitigation actions, along with any notes about key assumptions or sensitivity analysis</p> <p>There no quantitative estimation of benefit cost ratio, but the expected result would be better health for the entire population.</p>   |
| Preconditions needed for successful implementation                | Understanding of the most vulnerable areas of dengue as a result of changing climate variables.   |
| Indicator(s) of success   | % of dengue fever cases and fatality reduced.   |
| Implementation arrangements                                       | <p>Responsible department(s)</p> <p>Department of Preventive Medicine, the National Center for Parasitology, Entomology and Malaria Control, and Communicable Disease Control Department, NIPH and Department of Hospital Services.</p>   |

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|                          | Other Government and external stakeholders involved in implementation<br>WHO, NGO, IPC and MOE. |
| Estimated total cost     | USD 1,500, 000  |
| Possible funding sources | Possible funding include bilateral donors, pooled funding and regular government budget.        |
| Timeframe                | Indicate the start and end year<br>2014-2018  |



Action Fiche No 4

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| Action 4  | Up-scaling Malaria Control Program to contain artemisinin-resistance Plasmodium falciparum parasites and moving toward malaria pre-elimination status in Cambodia (PIP 12-120).   |
| CCCSP and Sector CCSP Strategic Objective                         | This action can contribute to the Strategic Objective 2 “Reduce sectoral, regional and gender vulnerability to climate change impacts”, and Strategic Objective 5 “Improve capacities, knowledge and awareness for climate change response” under the CCCSP. It also responds to the Objective 1 “to improve health care infrastructure and capacity of health personnel to cope with vector-borne and water-borne diseases in the context of climate change” of the Sector Climate Change Strategic Plan of MoH.     |
| Rationale   | <p>This action links to the Health Strategic Plan2 which was integrated in NSDP update 2014-2018. It also contributes to the overall achievement of Climate Change Strategic Plan for Public Health and the government policy for full elimination of malaria by 2025.</p> <p>This action would reduce vulnerability of the rural population to malaria resulting from climate change by expanding malaria control program in areas of high climate risks, which would result in better health of the population.</p> |
| Category of climate change action                                 | Cat 2 – Modified  |
| Type of action  | Adaptation  |
| Short description of the action and expected results and benefits | <p>Short description</p> <p>Activities include procurement and distribution of impregnated bed-net, procurement of drugs, conducting research on drug resistance, spraying of insecticide, and awareness raising, administration and logistic arrangement.</p> <p>Expected results and benefits, including number of beneficiaries and type of impact on beneficiaries</p> <p>About 100,000 households would benefit from this action.</p>  |
| Cost effectiveness of the action                                  | Where possible, an estimate of the benefit cost ratio of adaptation actions and the marginal abatement cost of mitigation actions, along with any notes about key assumptions or sensitivity analysis.  |
| Preconditions needed for successful implementation                | Research on drug resistant vectors in the context of climate change.  |
| Indicator(s) of success   | % of malaria contracting and fatality cases reduced.  |
| Implementation arrangements                                       | <p>Responsible department(s)</p> <p>Department of Preventive Medicine, the National Centre for Parasitology, Entomology and Malaria Control, NIHP, Department of Hospital Services and Communicable Disease Control Department.</p>   |

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|                          | Other Government and external stakeholders involved in implementation<br>WHO and NGOs.   |
| Estimated total cost     | USD 30,000, 000  |
| Possible funding sources | Pooled funding, green climate fund, climate adaptation fund, government budget, and GIZ. |
| Timeframe                | Indicate the start and end year<br>2014-2018   |

Action Fiche No 5

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| Action 5  | Up-scaling of National program on acute respiratory infection, diarrhoea disease and cholera in disaster prone-areas, including conducting surveillance and research on water-borne and food borne diseases associated with climate variables.   |
| CCCSP and Sector CCSP Strategic Objective                         | This action can contribute to the Strategic Objective 2 "Reduce sectoral, regional and gender vulnerability to climate change impacts", and Strategic Objective 5 "Improve capacities, knowledge and awareness for climate change response" under the CCCSP. It also responds to the Objective 1 "to improve health care infrastructure and capacity of health personnel to cope with vector-borne and water-borne diseases in the context of climate change" of the Sector Climate Change Strategic Plan of MoH.  |
| Rationale   | <p>This action links to the Health Strategic Plan2 which was integrated in NSDP update 2014-2018. It also contributes to the overall achievement of Climate Change Strategic Plan for Public Health.</p> <p>This action would reduce vulnerability of the rural population to water borne and food borne diseases by up-scaling national program and surveillance to the areas of high climate risks, especially in the provinces of natural disaster such as Ketsana, storm surges and severe flooding.</p>   |
| Category of climate change action                                 | Cat 2 – Modified   |
| Type of action  | Adaptation   |
| Short description of the action and expected results and benefits | <p>Short description</p> <p>Review the existing climate related surveillance and research, review existing control activities related to food borne and water borne diseases, planning the surveillance and research, and updating the communicable disease control, procurement of necessary equipment such as mobile weather station, transportation, computers, laboratory kits, ...etc and recruitment of staff, administration and logistic arrangement.</p> <p>Expected results and benefits, including number of beneficiaries and type of impact on beneficiaries</p> <p>The rural population in the areas of climate change risks such as in flood prone, disaster-prone and drought prone areas would have access to better prevention and treatment of the water borne and food diseases.</p> |
| Cost effectiveness of the action                                  | No existing estimation of benefit and cost ratio.  |
| Preconditions needed for successful implementation                | Understanding on the relationship between potential climate change implications on water borne and food borne diseases, including sanitation and hygiene.  |



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| Indicator(s) of success     | <p>% of population contracting respiratory infection detected and treated as a result of climate change.</p> <p>% of population contracting water and food borne (diarrhoea, cholera, dysentery...etc.) detected and treated as a result of climate change.</p> <p>Number of surveillance activities operating in areas of high climate risks (disaster prone areas).</p>   |
| Implementation arrangements | <p>Responsible department(s)</p> <p>The Department of Preventive Medicine would play a key role in cooperation with National Center for Health Promotion, Communicable-Diseases Control Department (CDCD), Hospital Services Department, NMCHC, NIPH, UHS, and the Department of Drugs, Food and Cosmetics.</p> <p>Other Government and external stakeholders involved in implementation</p> <p>WHO, NGOs, IPC and MOE.</p> |
| Estimated total cost        | USD 800, 000  |
| Possible funding sources    | Government budget, bilateral donors and Climate Adaptation Fund.  |
| Timeframe                   | Indicate the start and end year<br>2014-2018  |

Action Fiche No 6

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| Action 6  | Development and implementation of data management system on health outcomes arising from natural disasters and other man-made disasters, taking into consideration gender impacts, in synergy or collaboration with the Cambodia Red Cross, NCDM, MOWA, MOE and other relevant agencies.   |
| CCCSP and Sector CCSP Strategic Objective                         | This action can contribute to the Strategic Objective 2 "Reduce sectoral, regional and gender vulnerability to climate change impacts", and Strategic Objective 5 "Improve capacities, knowledge and awareness for climate change response" under the CCCSP. It also responds to the Objective 2 "to enhance emergency preparedness and response to cope with extreme weathers and climate change related disasters" of the Sector Climate Change Strategic Plan of MoH.   |
| Rationale   | <p>This action links to the Health Strategic Plan2 which was integrated in NSDP update 2014-2018. It also contributes to the overall achievement of Cambodian Millennium Development Goals, Climate Change Strategic Plan for Public Health and the Strategic National Action Plan for Disaster Risk Reduction 2008-2013.</p> <p>This action would improve knowledge and understanding on impacts of disasters on public health by putting into practice the data collection system, which will be used to support health preparedness and responsive-to-disaster plans.</p>   |
| Category of climate change action                                 | Cat 2 Modified   |
| Type of action  | Adaptation   |
| Short description of the action and expected results and benefits | <p>Short description</p> <p>Developing database system and guidelines for data collection on disaster and health impacts in coordination with NCDM, Cambodian Red Cross, MOWA and MOE, organizing training of staff at national and provincial level, holding consultation with sub-national committees and provincial health departments for planning of data collection and reporting on health impacts of disasters, administration and logistic arrangement.</p> <p>Expected results and benefits, including number of beneficiaries and type of impact on beneficiaries: 200 technical staff from referral hospitals and health care centres across the country will be trained and work on data collection and analysis.</p> |
| Cost effectiveness of the action                                  | <p>Where possible, an estimate of the benefit cost ratio of adaptation actions and the marginal abatement cost of mitigation actions, along with any notes about key assumptions or sensitivity analysis.</p> <p>Knowledge on disaster impacts on health would improve disaster preparedness and response plan which would result in reduced morbidity and mortality rate.</p>   |

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| Preconditions needed for successful implementation | This action can be combined with action 8.<br>Computer knowledge and spreadsheet.   |
| Indicator(s) of success                            | Regular report on health impact of disasters produced and reported.   |
| Implementation arrangements                        | Responsible department(s)<br><br>Department of Health Planning and Information, Department of Preventive Medicine and Hospital Services Department.<br><br>Other Government and external stakeholders involved in implementation<br><br>MOE, NCDM, MOWA, NIS. |
| Estimated total cost                               | USD 250, 000  |
| Possible funding sources                           | WHO, UNDP, GEF, Climate Adaptation Fund, Green Climate Fund, and pooled funding.  |
| Timeframe  | Indicate the start and end year<br>2014-2018  |



Action Fiche No 7

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| Action 7  | Strengthening emergency preparedness and responsive network and plans, including food safety response, at all levels.   |
| CCCSP and Sector CCSP Strategic Objective                         | This action can contribute to the Strategic Objective 2 "Reduce sectoral, regional and gender vulnerability to climate change impacts", and Strategic Objective 5 "Improve capacities, knowledge and awareness for climate change response" under the CCCSP. It also responds to the Objective 2 "to enhance emergency preparedness and response to cope with extreme weathers and climate change related disasters" of the Sector Climate Change Strategic Plan of MoH.  |
| Rationale   | <p>This action links to the Health Strategic Plan2 which was integrated in NSDP update 2014-2018. It also contributes to the overall achievement of Cambodian Millennium Development Goals, Climate Change Strategic Plan for Public Health and the Strategic National Action Plan for Disaster Risk Reduction 2008-2013.</p> <p>This action would build capacity of medical staff to improve disaster preparedness and responsive plans to cope with health implications caused by climate change, e.g. severe storm surges and flooding.</p>  |
| Category of climate change action                                 | Cat 3   |
| Type of action  | Adaptation  |
| Short description of the action and expected results and benefits | <p>Short description</p> <p>Review existing emergency preparedness and responsive plans at all levels, setting up or improve emergency preparedness plans, establishing and improving health responsive network/unit at national and referral hospitals, and equipping the network with necessary medical equipment, facilities, drugs, materials (first aid), transportation means (boat, vehicle, ambulance), conducting awareness raising on health implications associated with disasters, administration and logistic arrangement.</p> <p>Expected results and benefits, including number of beneficiaries and type of impact on beneficiaries</p> <p>A large proportion of affected people will receive proper support from medical team during and after disasters, thus saving lives and reducing injuries.</p> |
| Cost effectiveness of the action                                  | Where possible, an estimate of the benefit cost ratio of adaptation actions and the marginal abatement cost of mitigation actions, along with any notes about key assumptions or sensitivity analysis   |
| Preconditions needed for successful implementation                | Need coordination with NCDM, referral hospitals, and local authorities.   |
| Indicator(s) of success   | Morbidity and mortality rate per disaster event.  |
| Implementation arrangements                                       | <p>Responsible department(s)</p> <p>Department of Preventive Medicine, CDCD, NMCHC, CNM, Hospital Services Department and district referral hospitals (SOA).</p>  |

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|                          | Other Government and external stakeholders involved in implementation<br>NCDM, Red Cross, and sub-national administrations. |
| Estimated total cost     | USD10,000, 000  |
| Possible funding sources | Pooled funding, government budget, Climate Adaptation Fund, Green Climate Fund, WHO, UNDP, and GEF.                         |
| Timeframe                | Indicate the start and end year<br>2014-2018  |

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| Indicator(s) of success     | <p>Number of climate change awareness related materials developed and implemented.</p> <p>Number of targeted vulnerable people participated in awareness health education capacity building.</p>  |
| Implementation arrangements | <p>Responsible department(s)</p> <p>Department of Preventive Medicine, Department of Health Planning and Information, Hospital Services Department, CNM, NMCHC, NCHP and district referral hospitals (SOA).</p> <p>Other Government and external stakeholders involved in implementation</p> <p>MOE, WHO.</p> |
| Estimated total cost        | USD 1,000, 000  |
| Possible funding sources    | CCCA, government budget, WHO.   |
| Timeframe                   | Indicate the start and end year<br>2014-2018  |



Action Fiche No 11

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| Action 11   | Capacity development for mainstreaming climate change in annual operation plans of Special Operating Agencies (SOA) as part of the Service Delivery Grant (Pooled Funding Modality).   |
| CCCSP and Sector CCSP Strategic Objective                         | This action can contribute to the Strategic Objective 2 “Reduce sectoral, regional and gender vulnerability to climate change impacts”, and Strategic Objective 5 “Improve capacities, knowledge and awareness for climate change response” under the CCCSP. It also responds to the Objective 3 “To improve knowledge and research capacity on health impacts and vulnerability to climate change as an information base for mainstreaming climate change in the health strategic planning of MoH and other sector planning” specified in the Sector Climate Change Strategic Plan of MoH.  |
| Rationale   | <p>This action links to the Health Strategic Plan2 which was integrated in NSDP update 2014-2018. It also contributes to the overall achievement of Cambodian Millennium Development Goals, Climate Change Strategic Plan for Public Health and the Strategic National Action Plan for Disaster Risk Reduction 2008-2013.</p> <p>Integration of climate change planning at the sub-national level is one of the strategic policy responses specified under CCCSP and NSDP as it would help sub-national administrations to get sufficient funding support to mitigate at the level that climate change incidents are more frequent and pronounced.</p> |
| Category of climate change action                                 | Cat 3 – dedicated  |
| Type of action  | Adaptation   |
| Short description of the action and expected results and benefits | <p>Short description</p> <p>Conducting training need assessment for planning, mapping of health vulnerability in SOA areas, preparation of training materials, organizing training workshop, and developing annual work-plan by SOAs, administration and logistic arrangement.</p> <p>Expected results and benefits, including number of beneficiaries and type of impact on beneficiaries.</p> <p>Increased budget allocation from pooled funding to address climate change related diseases will benefit rural population that are most vulnerable to climate change impacts.</p>  |
| Cost effectiveness of the action                                  | <p>Where possible, an estimate of the benefit cost ratio of adaptation actions and the marginal abatement cost of mitigation actions, along with any notes about key assumptions or sensitivity analysis.</p> <p>Capacity building on planning would increase climate related health activities implemented by SOAs (36 SOAs operate now at the sub-national level) by allocation of funding from the pooled funding which is available for US\$50-70 million per annum.</p>   |

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| Preconditions needed for successful implementation | This action can be combined with action 6, 8 and 9.<br>Understanding of the health impacts of climate change in the areas under SOA responsibility.   |
| Indicator(s) of success                            | Number of SOAs integrating climate change related health response in their annual work-plan.  |
| Implementation arrangements                        | Responsible department(s)<br><br>Department of Preventive Medicine, Department of Planning and Health Information (DPHI), Hospital Services Department and district referral hospitals (SOA).<br><br>Other Government and external stakeholders involved in implementation<br><br>MOE, WHO. |
| Estimated total cost                               | USD 250, 000  |
| Possible funding sources                           | CCCA, Adaptation Fund   |
| Timeframe  | Indicate the start and end year<br>2014-2018  |

### Climate Change Technical Working Group for Health Sector

| No.        | Name                       | Position  | Organization |            |
|------------|----------------------------|---|--------------|------------|
| 1.         | H.E. Prof. SEA Huong       | Under-Secretary of State  | MOH          | Chair      |
| 2.         | Prof. PRAK Piseth Raingsey | Director, PMD   | MOH          | Vice-Chair |
| 3.         | Dr. LY Sovann              | Director, CCD   | MOH          | Vice-Chair |
| 4.         | Dr. KOL Hero               | Deputy Director, PMD  | MOH          | Member     |
| 5.         | Prof. NGAN Chantha         | Deputy Director, CNM  | MOH          | Member     |
| 6.         | Dr. THO Sochantha          | Deputy Director, CNM  | MOH          | Member     |
| 7.         | Dr. NGETH Sovann           | Deputy Director, PMD  | MOH          | Member     |
| 8.         | Dr. SOK Kanha              | Deputy Director, DPIH   | MOH          | Member     |
| 9.         | Dr. KHOU Ieng Ou           | Deputy Director, DPIH   | MOH          | Member     |
| 10.        | Dr. SOK Srun               | Deputy Director, HSD  | MOH          | Member     |
| 11.        | Mrs. LUCH Sorany           | Chief, Meteorology Office   | MOWRM        | Member     |
| 12.        | Mr. CHHOR Dany             | Office Chief, Forest Administration                               | MAFF         | Member     |
| 13.        | Ms. KHLOUK Vichetratha     | Vice Chief, Climate Change Department                             | MOE          | Member     |
| 14.        | Mr. EAN Sokoeu             | Chief of Disaster and Environmental Health Management Bureau, PMD | MOH          | Member     |
| Consultant |                            |   |              |            |
| 15.        | Dr. NEOU Bonheur           |   | MOE          |            |
| 16.        | Mr. PROM Thary             |   | MOE          |            |