Terms of Reference (ToR) for Studies on Interconnections and Implications of Climate Change and Communicable Diseases

1. Background:

Climate change has been identified as a major global health threat that affects human health in several ways. The effects of climate change on health in Nepal are varied and complex. As the climate shifts, it can directly and indirectly influence the occurrence, distribution, and severity of various diseases in the country. Changes in temperature and rainfall patterns can affect the breeding and behavior of disease vectors, leading to the spread of vector-borne diseases. Additionally, changes in precipitation patterns can impact water availability and quality, contributing to the transmission of waterborne diseases. Furthermore, the impacts of extreme weather events, such as floods and landslides, can disrupt health services, damage infrastructure, and displace communities, increasing the risk of communicable diseases.

In 2022, the Ministry of Health and Population (MoHP) conducted a vulnerability and adaptation assessment (VAA) of climate-sensitive health outcomes and risks. The VAA altogether considered 12 climate sensitive disease: 7 Vector borne diseases, 2 food and water borne, 1 respiratory disease, and 2 other climate sensitive diseases. Understanding the intricate relationship between climate change and diseases is vital for effective adaptation and mitigation strategies. Thus this Terms of Reference (ToR) is prepared to investigate and explore the linkages and assess the health impacts of climate change on communicable diseases within the Nepalese context. The findings will offer valuable insights on climate change-related health linkages and impacts in Nepal, informing evidence-based decision-making and fostering collaboration among government, researchers, healthcare professionals, and local communities. The activity is considered under GEF/UNDP/WHO funded project “Building Resilience of Health Systems in Asian LDCs to Climate Change”.

2. Objectives:

The main objective of this study is to investigate the linkages and impacts of climate change on communicable diseases at national level.

The specific objectives are as follows:

1. Identify the prevalence, incidence and trend of different types of climate-sensitive communicable diseases, including but not limited to dengue, scrub typhus, and food-borne diseases
2. Examine the relationship between climate change and the transmission and spread of climate-sensitive communicable diseases
3. Investigate the health impacts of climate-sensitive communicable diseases on affected populations.
4. Classify potential strategies for addressing the health impacts of climate-sensitive communicable diseases
3. **Methodology:**

This study aims to identify linkages and illuminate impacts of climate change on health by conducting a comprehensive analysis of existing literature, scientific research, local data, annual reports and engaging with relevant stakeholders. As part of this assignment, several communicable diseases should be prioritized, including but not limited to dengue fever, scrub typhus, Japanese encephalitis and food-borne diseases.

This study will use a mixed-methods approach that combines qualitative and quantitative research methods. The study will involve a review of existing literature, evidence and regular health data from Health Management Information System (HMIS), Early Warning and Reporting System (EWARS), dhis-2, Department of Health Services (DoHS) annual reports and both observed and forecast climate data of Department of Hydrology and Meteorology (DHM). The review will be complemented by a qualitative analysis of Key informant interviews (KII) with relevant stakeholders like healthcare professionals, environmental experts, and policymakers. The study will also involve a quantitative analysis of available secondary data to analyze and interpret incidence, prevalence, set linkages and assess impacts of climate change on communicable and non-communicable diseases. The following activities could serve as complementary in accomplishing this assignment:

a. Inception work:
   It results in preparation of an inception report with modified methodology (if any), assessment tools (KII guideline, assessment and data recording tools), field operation plan, data collection and analysis plan, expected results and schedule. It includes following but not limited to:
   i. Inception meeting with relevant stakeholders such as Epidemiology and Disease Control Division (EDCD), Nepal Health Research Council (NHRC), World Health Organization (WHO) and other relevant agencies
   ii. Literature review:
      It includes review and consideration of following but not limited to:
      - DoHS Annual reports
      - EWARS Bulletins
      - DHM reports and bulletin
      - Vulnerability and Adaptation Assessment (VAA) report
      - Health National Adaptation Plan (H-NAP)
      - Nepal Demographic Health Survey (NDHS), 2022
      - STEPS Survey Nepal 2019
      - Meteorological information
      - Scientific publications and
      - Other published / unpublished relevant documents
   iii. Preparation of assessment tools like KII guideline and data recording tools
   iv. Preparation of data collection and analysis plan
   v. Preparation and submission of Inception report
b. Consultative meeting with different stakeholders:
The selected institution has to conduct consultative meetings with MoHP, EDCD, NHRC, DHM and WHO and officials of other related agencies. There will be at least 2 technical review meetings under the EDCD preferably during inception phase and after field work.

c. Field work:
It includes key informant interviews, collection of health data from various sources like EWARS, HMIS, dhis2, DoHS annual report etc., and collection of climate data (both observed and forecasted) from Department of Hydrology and Meteorology. It also includes collection of relevant reports and data from various relevant sources for the study purpose.

d. Reporting:
A report should be drafted for linkage and impact of climate change with communicable disease. The draft report will be shared in technical review meeting at EDCD. The final report should consider all the relevant constructive suggestions from the reviewers and will be finalized after sharing at broad stakeholder’s workshop.

e. Scientific manuscript:
At least one original scientific manuscript should be prepared to explore the linkages and impact of climate change on communicable diseases. It should be ensured that the draft article complies with the policies and guidelines of the target international journal. The choice of journal will be discussed in review meetings.

f. Stakeholder’s workshop:
At the end of the assignment, the EDCD will facilitate to organize a broad stakeholder’s workshop with participation of all relevant agencies. The final report with findings, lessons learnt, and recommendations will be presented.

4. Ethical Considerations
The selected institution should obtain ethical clearance for the study from Nepal Health Research Council (NHRC) within the specified study duration. The institution should be responsible in outlining the documentation, information required and needful costings for ethical clearance application.

5. Human resources
A Team Lead with support from a team of Experts and team assistants will carry out the assignment. The team should have extensive experience of working in investigation of linkages between climate and public health related sector and especially related with climate induced health impacts.
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<th>S.N.</th>
<th>Position</th>
<th>Min. Qualification</th>
<th>Preferable Experience</th>
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| 1    | Team Lead                 | PhD / Masters in Public Health, Environment Science or related field                 | ○ Should have 10 years of general experience in conducting studies on environmental health areas and over 3 years of experience in environmental health areas (Climate Change, Air Quality and Public Health)  
○ Should have the ability to develop research protocols, obtain ethical approvals, and implement rigorous data collection, analysis and report as well as journal manuscript writing procedures.  
○ Should be adept at interdisciplinary collaboration |
| 2    | Epidemiologist            | Master’s in Public Health                                                            | ○ Should have 10 years of general experience in public health and over three years in conducting epidemiological and, environmental health research  
○ Should possess a solid foundation in epidemiological principles, methods, and study design  
○ Should be skilled in using appropriate statistical methods and software to analyze datasets, identify correlations, control for confounding factors, and assess the strength of associations  
○ Should have excellent communication skills to disseminate study findings through scientific publications |
| 3    | Climate Change Expert     | Master’s in Meteorology, Environment Science, Climate Science                         | ○ Should have 10 years of general experience in environmental assessment and over three years in conducting climate change scenario analysis and assessment  
○ Should have strong background in Climate Change Science including its drivers, impacts, and future projections  
○ Previous research experience in conducting research related to climate change and its health impacts will be an added advantage  
○ Proficiency in data analysis and statistical techniques for examining the associations between climate change variables and diseases |
| 4 | **Public Health Expert** | Master’s in Public Health | • Should have 10 years of general experience in conducting studies on public health  
• Experience of working in Nepal’s health system  
• Experience in program implementation to identify and recommend evidence-based interventions and strategies to mitigate the health impacts of climate change  
• Should have experience collaborating with experts from various disciplines such as climatology, environmental science and public health |
|---|---|---|
| 5 | **Two Team Assistants** | Bachelors in Public Health/ Environment Science/ Development Studies | • Should have 3 years of general experience in environmental/public health preferably in health research  
• Should be familiar with research methodologies, data collection techniques, and literature review processes  
• Should be able to assist in coordinating team meetings, maintaining communication with team members, and facilitating efficient collaboration among researchers, stakeholders, and partners involved in the study  
• Should have experience working in a team environment, contribute to team discussions, and provide support to ensure the smooth functioning of the study |

The team has to work closely with Disease Surveillance and Research Section under the Epidemiology and Disease Control Division.
6. Inputs

The ToR for each expert including man-days is provided as:

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<th>S.N.</th>
<th>Position</th>
<th>Detail Tasks</th>
<th>Input (Man-days)</th>
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| 1    | Team Lead    | - Overall responsibility with delivery of all reports and scientific manuscripts  
- Lead the development of the study design, research protocols, and data collection strategies, detailed work plan, including timelines and deliverables  
- Collaborate with multidisciplinary team members to define research objectives, research questions, and hypotheses  
- Oversee the collection and analysis of relevant data, including climate data, disease surveillance data, and other relevant health indicators  
- Oversee field activities in collecting primary information like KII and secondary information like regular health and climate data  
- Coordinate the research team, including researchers, data analysts, and field staff, to ensure effective collaboration and smooth implementation of study activities  
- Liaise with relevant experts in climatology, environmental science, and public health to incorporate their expertise into the study  
- Foster collaboration with external stakeholders, including government agencies, research institutions, and community organizations, to facilitate data sharing and knowledge exchange  
- Prepare regular progress reports on the study’s implementation, findings, and recommendations  
- Contribute to the development of scientific manuscripts and publications for peer-reviewed journals | 45               |
| 2    | Epidemiologist| - Conduct a comprehensive review of scientific literature, un/published reports, regular health and climate data to identify research needs on the relationship between climate change and diseases  
- Synthesize relevant findings and contribute to the conceptual framework of the study  
- Oversee the collection and analysis of relevant data, including climate data, disease surveillance data, and other relevant health indicators | 30               |
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<th>3</th>
<th>Climate Change Expert</th>
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| **•** Collect and analyze climate data, including temperature, precipitation, humidity, and other relevant variables, to assess their impact on disease patterns  
**•** Utilize statistical methods and modeling techniques to identify correlations and trends between climate change and health outcomes  
**•** Collaborate with the research team to integrate climate data with health data for comprehensive analysis  
**•** Identify best practices and successful case studies from other regions or countries for consideration in the study context  
**•** Contribute to the preparation of research reports, policy briefs, and scientific publications  
**•** Support team lead in designing the research activity, collecting & analyzing required data and drafting reports and journal articles |
| 4 | Public Health Expert | 20 |
| **•** Comprehensive review of scientific literature and reports on the relationship between climate change and diseases from a public health perspective  
**•** Assess the health risks associated with climate change and identify vulnerable populations and regions  
**•** Identify best practices and successful interventions from other regions or countries for consideration in the study context  
**•** Contribute to the preparation of research reports, and scientific publications  
**•** Support team lead in designing the research activity, collecting & analyzing required data and drafting reports and journal articles |
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<th>5</th>
<th>Team Assistants (2 persons)</th>
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<td>• Assist in literature reviews, data collection, and data analysis tasks as required</td>
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<td>• Contribute to the preparation of research reports, presentations, and other project deliverables</td>
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<td>• Collaborate with team members to ensure timely completion of assigned tasks</td>
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<td>• Assist in organizing and maintaining project documents, including research materials, reports, and correspondence</td>
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<td>• Assist in scheduling and coordinating meetings, workshops, and conferences related to the study</td>
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<td>• Provide logistical support for project events, such as workshops, review meetings, and other related activities</td>
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7. Deliverables and time period

The time period of the assignment will be three months, which shall commence with effect from the date of signing by both the Parties. The proposed dates and deadlines to carry out the assignment are:

- Inception report within two weeks of contract agreement;
- A draft report within ten weeks of contract agreement;
- A scientific manuscript within eleven weeks of contract agreement;
- A Final report by end of contract period

A Final consolidated report, at-least one Scientific manuscript, PowerPoint presentation of findings with graphical presentation are major deliverables. All deliverables including field photos, KII transcribes, and collected secondary climate and health data should be submitted with workable e-copies. Specific deliverables of this work are:

1. Inception report
2. Draft Report on climate change and communicable diseases
3. Original scientific manuscript on climate change and communicable diseases
4. Final Consolidated Report

8. Implementation Arrangement

The following agencies will be involved in this assignment:

1. **EDCD:** The Disease Surveillance and Research Section at the EDCD will be lead agency with overall technical supervision. It will coordinate with relevant stakeholders including Technical Working Group of Climate Sensitive Disease Surveillance, Nepal Health Research Council, Department of Hydrology and Meteorology, Integrated Health
Information Management Section and facilitate to make avail of necessary background materials concerning the assignment. It will provide support to coordinate with other agencies and organize technical review meetings and stakeholder’s workshop. It may also be involved in field work for facilitation and supervision of the activity.

2. **WHO:** The WHO Nepal will provide technical and financial support for this assignment. It will also support in coordination with other stakeholders as per need.

3. **An institution:** An institution with relevant experience will be engaged to carry out this assignment. It will manage to form a team of experts and logistics to carry out the overall assignment by organizing consultative meetings, performing reviews, data collection and analysis, writing technical reports as well as scientific manuscripts and facilitating a workshop among others in order to accomplish the assignment.

9. **Copyright**

Copyright for the documents will remain with MoHP, EDCD and WHO Nepal and includes the right to distribute the material or parts of it to other partners in Nepal and abroad. The institution and involved study team should not share any field documents, technical report and scientific manuscript.

The institution and involved experts should acknowledge that the copyright and ownership of the journal articles belong to WHO Nepal. The institution and involved experts should not claim authorship or ownership rights over the article or any part of it.

10. **Contact and communication in WHO Nepal:**

The selected institution should report and maintain close contact with the responsible NPO-Climate Change at WHO Nepal Country Office.