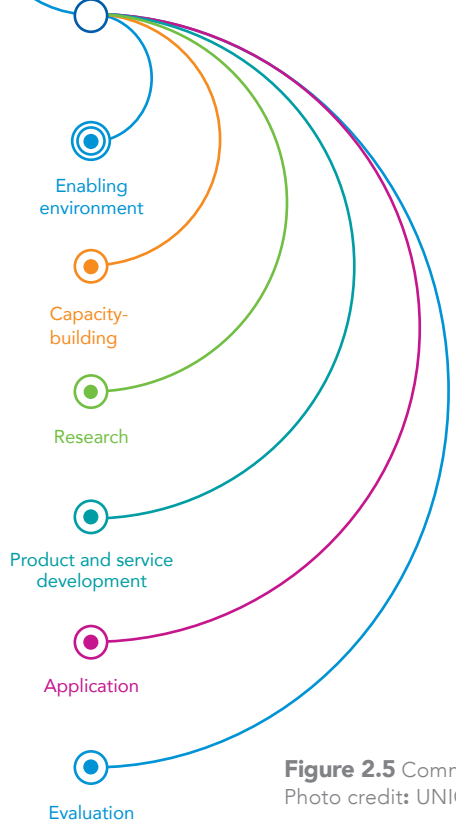

CASE STUDY 2C

LONG-TERM CLIMATE AND HEALTH COLLABORATION TO FORECAST MALARIA OUTBREAKS IN ETHIOPIA

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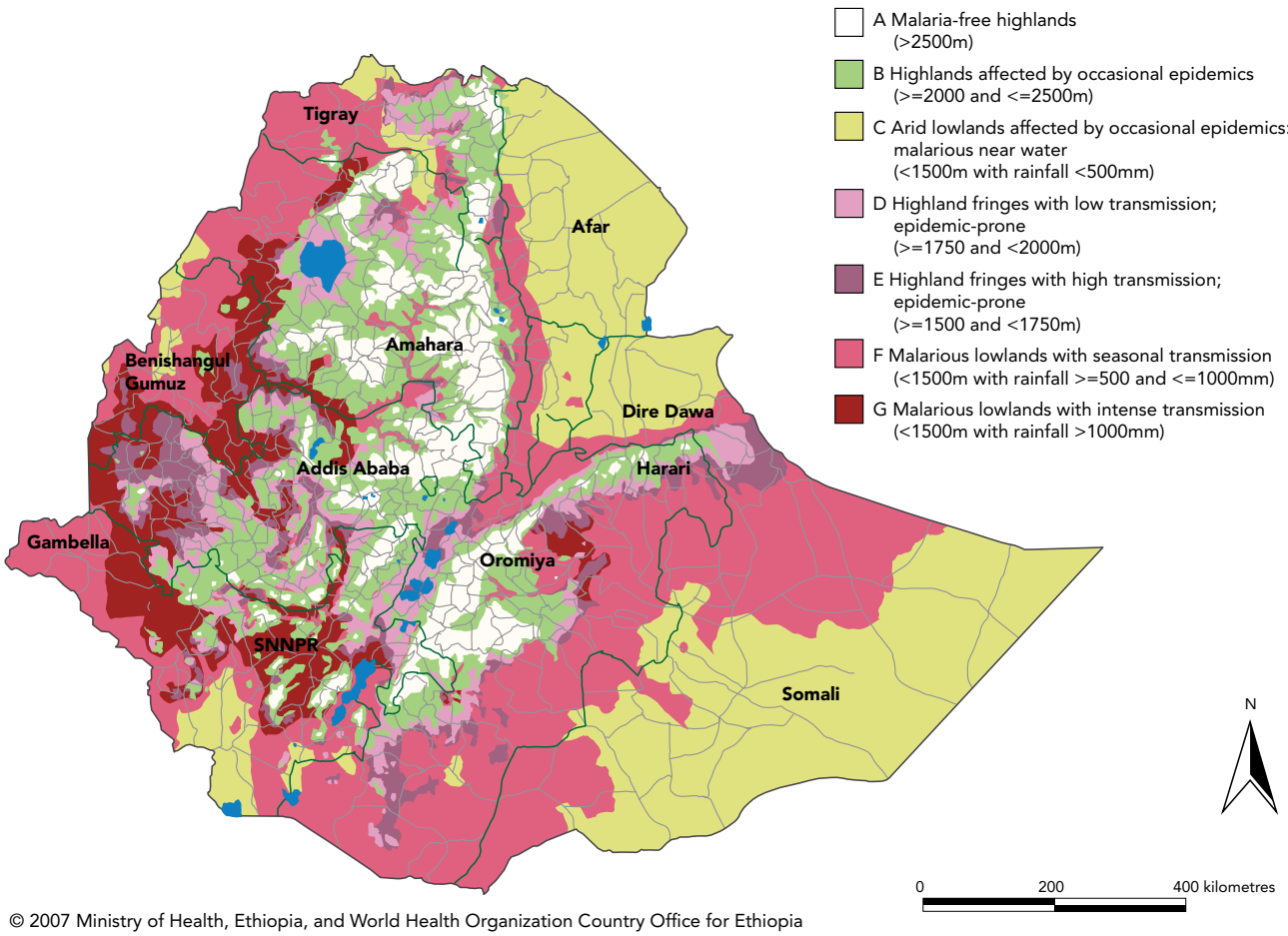
CONTEXT

Malaria is a major health problem in Ethiopia, with almost 60% of the total population (around 52 million) at risk of infection *(15)*. Altitude and climate are major determinants of malaria epidemiology *(16)*, and those variables are used for stratification to support the design of malaria interventions (Figure 2.6). Moreover, malaria transmission is seasonal and unstable, resulting in occurrence of epidemics overlapping with abnormal weather conditions *(17–19)*. This implies that monitoring of climate information is helpful in predicting malaria ahead of time and to guide early preparedness.

Figure 2.5 Community collecting water from a suitable *Anopheles* breeding site.
Photo credit**:** UNICEF - For non-commercial reuse.

Figure 2.6 Altitude and rainfall-based stratification of malaria in Ethiopia, 2007.



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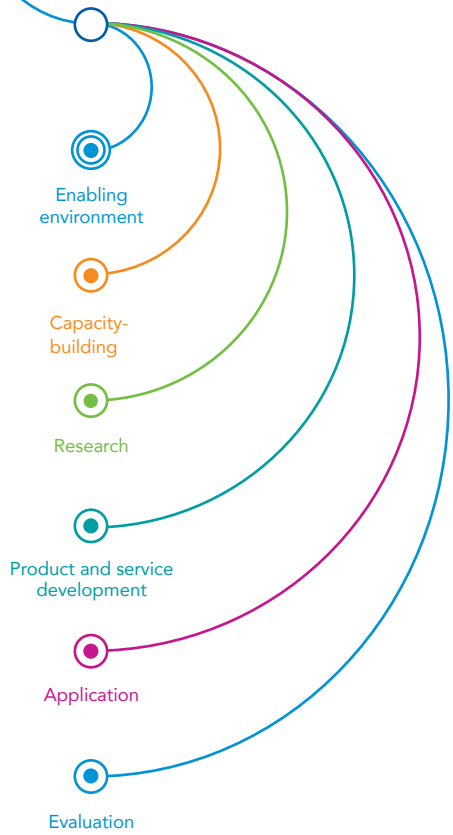
Note: Figure developed by Ministry of Health of Ethiopia and WHO Ethiopia Country Office as part of a proposal for the Global Fund to Fight AIDS, Tuberculosis and Malaria. Altitude and rainfall estimations are used to define strata A to G. Most of the areas (B, C, D and E) were known to be prone to epidemics, with repeated experiences of malaria epidemics of various magnitudes. As most of the Ethiopian population resides in the highlands, a large proportion of the population is at risk of malaria exposure during outbreaks.

CASE STUDY 2C



NEW APPROACHES

Ethiopia has been committed to malaria control for more than five decades, including through a renewal of efforts under the Roll Back Malaria Partnership that began in 1998 *(20)*. During 2000, the first Five-Year Strategic Plan for Malaria Prevention and Control (2001–2005) was designed as part of the RBM initiative *(21)*, which aimed to reduce the malaria burden by 50% by 2010 compared to the 2000 baseline. Epidemic prevention and control was the main component of the strategic plan. The use of climate information was found to be vital in epidemic forecasting and early detection. Accordingly, climate and health experts started collaborating in data sharing, technical support and other activities in the early 2000s, and several studies clearly showed the relationship between climate and malaria in various areas and assessed tools for epidemic forecasting *(18, 22, 23)*. Later, the Ministry of Health of Ethiopia allocated significant financial resources to improve the infrastructure of meteorological sites and the data management system at the National Meteorology Agency using a grant from the Global Fund to Fight AIDS, Tuberculosis and Malaria, which has helped in ensuring an improvement in the quality of climate information.

In addition, trainings were organized for professionals engaged in malaria control programmes at various levels. The National Meteorology Agency tailored its service towards supporting decision-making in forecasting malaria transmission using already proven tools *(24)*. The use of such tools enabled an association to be made between rainfall and temperature on the one hand, and the biology of malaria parasites and mosquitoes on the other hand, in order to forecast the possibility of a malaria outbreak. The Ministry of Health of Ethiopia is well informed about malaria risks and shares relevant information with regional states for action at grassroots level or in health facilities and communities.

ACKNOWLEDGEMENTS

Federal Democratic Republic of Ethiopia
Ministry of Health

BENEFITS AND LESSONS

The collaboration between the climate and health communities has not only supported informed decision-making in the health sector but has also improved the quality of climate data and its accessibility to users. Health planners at various levels have come to appreciate the importance of climate information in their decision-making processes. The National Malaria Control Programme now shares a monthly bulletin with regional health bureaus for planning and decision-making. In addition, a number of malaria epidemiological studies have focused on climatic variables and the development of malaria prediction models *(25)*. Similarly, the National Meteorology Agency has given attention to improving the quality of climate information and generating quality data *(26)*. Moreover, the climate and health community established the Climate and Health Working Group, which was forged from various institutions during 2008. Between 2008 and 2010, this group helped strengthen human resource capacity-building to improve the use of climate information at national and local levels in Ethiopia.

In the past two decades, the climate and health sectors have come together to create opportunities for knowledge translation and technology transfer in Ethiopia. This collaboration has also stimulated the use of climate information in Ethiopia and attracted research. Online data accessibility via the National Meterology Agency website *(29)* and related technical support have resulted in improved climate services. Despite these successes, certain limitations remain, including lack of adequate financial resources to sustain capacity-building for climate information users in the health sector. In addition, the national network for climate and health, including the Climate and Health Working Group, has not been sustained, partly due to the lack of clear institutional arrangements. Also, the capacity-building scheme emphasized the involvement of participants from regional health bureaus, but high turnover of staff, and transfer of staff between departments, have made it difficult to create a body of experts able to use climate data on an ongoing basis for public health decision-making. The curricula used also did not adequately address the needs of the climate–health interface. Finally, there are limited resources for disseminating malaria forecasting tools, and appropriately downscaling information for decision-making at the resolution of the district level.