

## ZAMBEZI ECOHEALTH PARTNERSHIP

*To promote global health research as a model and a driver of collaboration, partnership and equity in the generation and use of new knowledge for improving health and well being in Zambia and globally.*

MINISTRY OF HEALTH

### **2019 Annual Report**

#### **SUMMARY**

Although the Zambezi EcoHealth Partnership (ZEP) venture began in 2016, it became a more specific entity in 2018, signaled by the development of its first 3-year strategic plan (2019-2021). This report, about the main achievements and developments of the first year of this plan, will summarize four components of the “ZEP story”:

- A brief background about the Zambezi watershed area, mainly in Zambia’s Western Province;
- The evolution of the ZEP through its early years;
- Highlights of achievements in 2019, including some reflections;
- A “looking ahead” perspective on opportunities for 2020 and beyond.

#### **Background:**

Western Province includes the Barotse flood plains of the upper Zambezi river catchment area. The Zambezi river system is amongst the largest in the world, and the fourth largest in Africa. The system naturally floods during the rainy season thus sustaining biodiversity, pastoral, and agricultural systems, with local systems, cultures, and practices adapted to this cycle. However, the increasing variability in rainfall patterns observed in recent years has led to unpredictable flood events both in terms of timing and magnitude, placing many thousands of people at risk, affecting transportation infrastructure, changing local disease dynamics, and impairing access to health resources. These flooding events have been interrupted by periods of increasingly severe drought. Western Province (WP) is at the forefront of many of these challenges. The province is amongst the poorest in Zambia, with 83% of the population of 1,024,505 living on less than \$2/day. Western Province currently has the second highest HIV prevalence rates in Zambia, with 16% of the population living with HIV. Neonatal, infant, and under-five mortality rates are amongst the highest in the country (the country neonatal mortality rate is 21/1000 and infant mortality rate is 43/1000; 40,000 children under 5 died in 2015). Just over one-third of deliveries are attended by skilled health personnel, and less than one-half of health centres have two or more professional health staff (nurses, midwives, clinical officers, environmental health officers).

Recent efforts by the Government of Zambia to develop infrastructure in the region have included the creation of additional districts, building of schools and health posts in these new districts, and the promise (yet unrealized) of a public university. A new, private university (the University of Barotseland) has been established by prominent Zambians who identify Western Province as their home. Although

these developments show promise in meeting the needs of the province, lack of resources – human, financial, and informational – remain barriers.

### **Evolution of ZEP:**

Inaugural discussions in 2016 involved three core partners: the Zambia Ministry of Health (through the Western Province Health Office), the University of Barotseland (UBL) and the Canadian Coalition for Global Health Research (CCGHR), along with some associate partners. A key feature was the creation of an integrated, multi-disciplinary and sustainable knowledge platform (ZEP-KP), envisioned as an important tool to address key challenges in WP through identifying cost-efficient planning and intervention strategies. Based on an international partnership focused on meeting local priorities, the ZEP-KP is designed to build a comprehensive, openly accessible, and integrated information system that will provide public authorities, and civil society, the evidence needed to enact effective health system improvements. Much of this information may also be relevant outside of the health sector; for example, understanding of changing flood patterns and regional hydrology will be of relevance to agricultural development, and will also permit the identification of particularly vulnerable communities for tailored and focused social programs.

Soon after its launch, the ZEP-KP received funding for two initial projects:

- Support to UBL to establish a cashew focus curriculum, from the Africa Development Bank through the *Cashew Infrastructure and Development Project*;
- The “*FLOODMAL*” project from the UK National Environment Research Council (NERC) to Aberystwyth University, to map malaria vector hotspots.

Other collaborative research groups were created to address other challenges such as childhood malnutrition, water, sanitation and health, and access to health services.

By 2018, it became apparent that a longer-term strategic plan was needed. This included the following 3-year goal statement:

*Over the next three years (2018 – 2021), ZEP will continue to:*

- *Identify research questions (problems, challenges) relevant to the health and livelihood of communities in the Zambezi watershed;*
- *Assemble inter-disciplinary research teams to address priority challenges, together with community collaborators;*
- *Co-create solution-oriented knowledge on the identified challenges;*
- *Apply the newly-created knowledge to the situations where the original questions were identified, integrating new solutions at appropriate community and system levels.*

*To achieve the above, ZEP will build and strengthen the capacities of all participating partners.*

The plan included the creation of a number of research clusters: health systems, food security and nutrition; water and health; remote sensing and hydrological information systems; climate change and environmental degradation and mining and health. It also included capacity strengthening activities and links to other relevant activities elsewhere in Zambia.

### **2019 Highlights and some reflections:**

A key development in 2019 was the finalizing of a Memorandum of Understanding (MOU) involving the three founding partners.

Highlights from the work of ZEP's **research clusters** include:

- **Health systems:** building upon the results of the FLOODMAL project, a proposal focused on access to health services in the Barotse flood plain is being developed. In addition, a "*Zambia Data Use*" project has been initiated, to identify barriers to the use of sub-national health data in WP. Another project, led by Dr. Rachel Rahman of the University of Aberystwyth, is addressing the challenges of nursing in rural Zambia.
- **Food security and nutrition:** The "*Cashew Rejuvenation and Establishment (CARE) project*" is proceeding well. A new project led by Christine Edet (PhD candidate at U.Waterloo) and Professor Fastone Goma (UNZA) is: "*Food Security and tobacco farming in rural Zambia*".
- In the **FLOODMAL** project, work on the hydrological-hydraulic component has been completed. In another component, work on radar-remote sensing of wetlands has led to a time-series maps of water, vegetated-water and dry classes of wetlands. Both the hydro model and the remote sensing products could now form the basis for water-disease modelling and access to health facilities. Also, the FLOODMAL field survey of malaria vectors has been completed and genomic analysis is underway.
- **Climate Change and Environmental Degredation:** Work on the project: *Health Care Access and Utilization for Women and Children*, in the Barotse flood plain is underway, and is led by Mwimanenwa Njungu.
- **Mining and Health:** Work is continuing on the project: *Mining Contradictions: Reconciling Gender, Mining and Governance in Zambia*. Discussions with the Ministry of Health, ZEMA and Caritas are continuing toward a project that will strengthen mining governance in Zambia.

Regarding the **capacity strengthening** component, Zambian scholars Douglas Singini and Mwimanenwa Njungu are continuing their PhD studies at the University of Waterloo, along with several other PhD scholars who are conducting their studies within the ZEP program. They are Michelle Lee (Health Systems), Christine Edet (Food Security) and Lesley Johnstone (Mining and Health). Several other UK research trainees are contributing to the FLOODMAL project.

### **Some reflections on developments in 2019:**

**Publications:** The first research reports reflecting the activities within the ZEP initiative have been published. Examples include a paper from the FLOODMAL project about the radar-remote sensing of wetlands (Hardy et al), and a 2019 publication by Inonge Milupi about "*Climate Change Impacts, Vulnerability, and Adaptation among the Lozi speaking people in the Barotse Floodplain of Zambia*". Work on several other manuscripts is underway.

**Applying solution-oriented knowledge:** A key goal of the ZEP initiative is to conduct research on locally-relevant questions, and apply the resulting new knowledge to the situations where the original questions were identified. An example from the FLOODMAL project involves using evidence about malaria vector "hot spots" (from remote-sensing data) to guide decisions about effective indoor spraying conducted by Ministry of Health teams.

**Farewell to Alex:** Our colleague Alexandra (Alex) Malloy has been the ZEP program manager since ZEP began. Alex has moved on to other responsibilities at the end of 2019. The ZEP team says a big thank you to Alex for her hard work, commitment, creativity and collegueship. She has agreed to continue with the ZEP team as an advisor.

### **Looking ahead:**

As the ZEP team begins the second year of its 3-year strategic plan, we are considering several challenges and opportunities that will influence our work.

Climate Change in Zambia: During 2018 and 2019, Zambia faced an increasingly severe drought situation due to unpredictable rains. The World Food Program (WFP) reported that an estimated 2.3 million people in 58 districts, representing 25% of Zambia’s total population, were in need of humanitarian assistance. Looking ahead, it is becoming apparent to the ZEP team that in fact the climate change situation will influence virtually all of our activities. We will continue to collaborate with provincial and national leaders to contribute to evolving plans. An example are discussions with Dr Andrew Silumesii, National Public Health Director, about the challenge of health systems resilience related to climate change. In fact, the Ministry of Health has recently published a relevant report: *Health National Adaptation Plan to Climate Change” (2019).*

Monitoring Impacts: As we continue with our work in 2020, the ZEP team will be guided by a set of intended longer-term impacts identified in our strategic plan, summarized here:

- *To provide trans-disciplinary approaches and knowledge solutions that will improve the lives of people in the Zambezi floodplains, particularly related to health, food security and nutrition.*
- *To serve as a model for equitable and sustainable research partnerships. The model includes the use of both societal and scientific knowledge, at all stages of the research process—problem framing, production of solution-oriented knowledge, and the integrated application of new knowledge to relevant challenges.*
- *To strengthen the capacities of all partners to produce and use relevant knowledge, at both the individual and institutional levels. A special focus will be on supporting and mentoring the next generation of leaders.*

New partners: Professor Chris Thomas has recently moved to the University of Lincoln to take up a Global Chair in Water and Planetary Health, as well as the co-directorship of the Lincoln Centre of Water and Planetary Health. This opens up opportunities to collaborate with colleagues who are involved in related research in: Climate Change and Extreme Weather Events, Ecosystem Dynamics, Environmental Contamination, and other areas. Meanwhile, Dr. Rachel Rahman will continue to serve as the contact person for ZEP-related collaborations at the University of Aberystwyth.

Chris has also been appointed as Visiting Professor in Wildlife Biology at the University of Namibia, with whom he has been collaborating for several years in UK-Namibia institutional partnership building through the UK GCRF fund. UNAM have an excellent campus at Katima Mulilo, 3 hours south of Mongu just across the Zambia-Namibia border. Of relevance to ZEP, UNAM is building a new wildlife research centre on the campus and there also is a vision to develop a linked research institute in infectious diseases, including human, veterinary and wildlife diseases, taking an eco-health approach.