



LAKE TANGANYIKA
FLOATING HEALTH CLINIC

Water-based Health Care: Have We Missed the Boat?

Health Systems Building in Water-based Communities

Part Two of a Series on Integrated Development in Africa's Great Lakes Region



WAVE

Water Based Aid, Value, Engagement

The work of the Lake Tanganyika Floating Health Clinic



WAVE

Water Based Aid, Value, Engagement

The Lake Tanganyika Floating Health Clinic (LTFHC) has been helping the communities that live around the lake basin for more than half a decade.

In this almost wholly neglected area we:

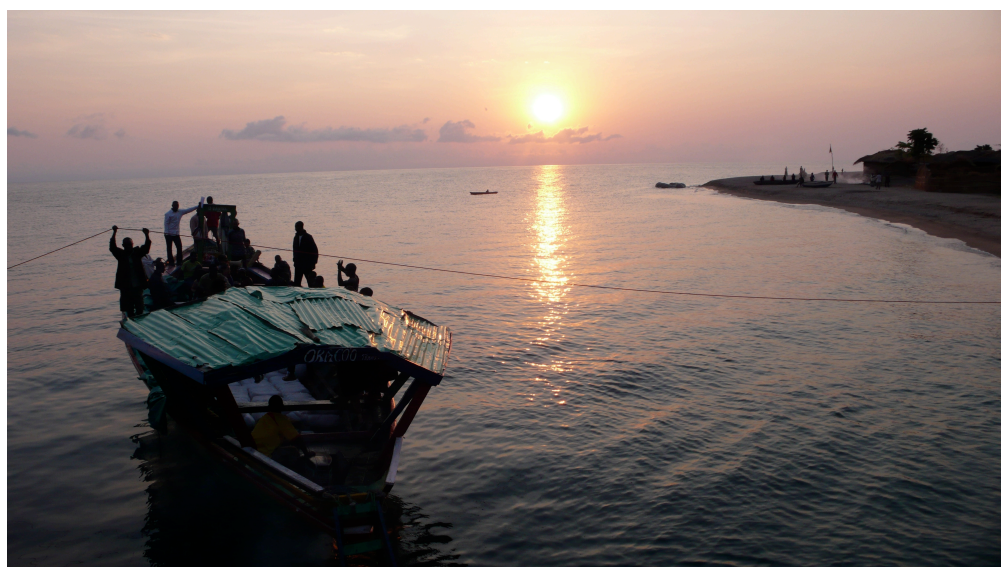
- deliver vital healthcare
- distribute necessary medical supplies
- establish important communication hubs
- gather essential medical data
- build strong relationships with the people and the governments of the region

This conflict ridden, resource rich region has become vital to the well-being and interests of the planet and our work is now recognized as crucial to its stable growth and development.

Describing the volume and variety of the work we undertake is a task in itself, so we have synthesized our activity into three representative words: Aid, Value, Engagement. Because we use the Lake itself as our highway, we call it water based. To make all this easy and convenient to remember, we call the work of the LTFHC...

WAVE

Water Based, Aid, Value, Engagement





Health care delivery systems have largely been designed for land-based communities, yet over 40% of the world's population live in water-based communities.

Viewing water-based communities as distinct geographic, cultural, and epidemiological units is important from a systems building perspective.

Water-based Communities

Humans have congregated around sources of water since the beginning of organized civilization and the advent of agriculture. Aside from sustaining life itself, fresh water is necessary for agriculture, energy, transportation, trade, economic activity, and health. Despite the crucial role water existentially plays, the international aid and development space has generally not considered health systems building from the perspective of water-based communities. In fact, the concept of “water-based communities” has not been considered heretofore. We propose disrupting the current status quo of systems building design by looking through the lens of water-based communities, a significant and increasingly vulnerable set of populations.

The overwhelming bulk of humanity is concentrated along or near coasts, with over 40 percent of the global population residing within 100 km of a coastline.¹ Migration, coupled with a projected increase in global population growth rate, will double the coastal population by 2025.² While the largest population of water-based communities is found along ocean coastlines, some of the most vulnerable water-based communities are located near river deltas and lake basins.

Water-based communities are located all over the world and diverse in population density, economic status, education and technical capabilities, ethnic and cultural backgrounds, occupation and livelihoods, and scale with respect to the human development indices. Despite their diversity, water-based communities experience many of the same challenges regarding transboundary systems management, as well as access, supply chains, and logistics – hugely important components of health systems.³ They also share similar vulnerabilities to natural disasters and climate change, although can differ radically in regards to their resilience against these threats.

Viewing water-based communities as distinct geographic, cultural, and epidemiological units is important from a systems building perspective. In many instances, particularly where large states share bodies of fresh water, water-based communities are on the periphery of the nation-state. The more peripheral these border regions are within the nation state, the more likely they are to engage with neighboring regions across the border, as they occupy a more central position within the cross-border region than they do within their actual state.⁴ This suggests that water-based communities are well suited for, and may benefit more, from regional integration, an approach that is greatly lacking in health systems building. The Lake Tanganyika Basin is an excellent example of these concepts at play in a real world setting, and will be explored further in this paper.

There are thought-leaders in other sectors who view systems design inclusive of water-based communities, as well as the transboundary attributes of water-based communities, particularly from an urban design perspective and in response to climate change, among other 21st Century challenges. The progressive architect, Kunlé Adeyemi, is pioneering sustainable floating infrastructures in African coastal cities.⁵ Through his leadership at the architectural firm, NLÉ, Adeyemi is reshaping the way systems are being designed to support sustainable development while increasing the resiliency and adaptability of water-based communities. Another renowned architect, David Adjaye, views systems design more in a regional context and less by nation state boundaries. He has come to understand that a whole other set of qualities should be looked at when thinking of systems building and core infrastructure design.

Adjaye documented African architecture by region in his tome *African Metropolitan Architecture* (New York, 2011) and *Adjaye Africa Architecture* (London, 2011). While working on this ten-year project he came to the conclusion that in certain climates with certain geographic elements, constraints, and cultures, there exists distinctive styles of architecture. Rather than looking at these components country by country, Adjaye organizes these architectural trends by region. He deconstructs the idea of the nation state in order to build a more effective system tailored to each region.^{6,7} Keeping these principles and concepts in mind, this paper focuses on new health systems building approaches in rural, underserved, water-based communities.



A good health system delivers quality services to all people, when and where they need them, requiring among other mechanisms, well-maintained facilities and logistics to deliver quality medicines and technologies.

- World Health Organization

Health Systems Building

Infrastructure design has largely been based on systems building models borne from the idealism of the industrial revolution in Western countries. Design was based on technological advances of the time, such as automation, assembly line production, and mass production. The concepts of industrial design, universal design*, “universal solutions”†, and human productivity have evolved substantially, but we continue to execute systems building and interventions by applying many of these older methods, especially within health care infrastructural design.⁸ Not only has industrial theory changed, it is also the case that those old theories are really no longer sustainable in the modern world. There have been many unintended consequences alongside the benefits of this industrial behavior. Its outcomes are tied to the complex environmental milieu we find ourselves in today.

The evolution of industrial and systems design is beyond the immediate purview of this paper; however, the rate of change and adoption in design theory has differed drastically by sector. Health care delivery systems have, in general, lagged behind other significant sectors –particularly with respect to bricks and mortar health infrastructure supported by international donors to developing countries. The western-style modern medical system is, in its fundamental design, rooted in the industrial revolution. This has created a blind spot for most medical systems limiting the sector’s ability to recognize fundamental changes in societal norms and expectations, as well as fundamental improvements in systems design as a whole, which cover problems as broad as how to deliver services efficiently while also taking into account the user experience (and in medical contexts – patient comfort and experience). This extends to supply chain and logistics, as well as environmental, geographic and cultural variables. Few design health systems with all these ideas in mind.

Water-based health care has typically been viewed by the traditional aid and development community through very narrow confines as either an emergency disaster response, or a stop-gap measure, and limited in scope by archaic financial models. Health care delivery systems have also largely been designed for land-based communities serviced by roads. This view excludes very large populations who tend to live in the global south and can be characterized as water-based communities. This paper will review a number of water-based systems that fall within the typical view of disaster response or stop-gap, but will also highlight past projects that have not been widely recognized as being at the vanguard of this new water-centric approach.

Organization of Paper

The organization of this paper is divided into three sections. The first as a primer to water-based communities, traditional health systems, examples of water-based care, and nuanced approaches to delivering health care. The second part of the paper delves into the challenges and impacts that climate change, water security, transboundary issues, and economics have on water-centric populations, and makes the case for revising health systems in water-based communities before it is too late. Part three describes how to build a better water-based health care system, using the Lake Tanganyika Basin as a case study, followed by policy recommendations.

* The aim of universal design is to develop theory, principles and solutions to enable everybody to use the same physical solutions to the greatest extent possible, whether it be buildings, infrastructure, means of communication and household goods, and services.

† Turnkey, “one-size fits all” approach.



Recommendation

WAVE's purpose in publishing this paper is to reset the way the humanitarian and development community views traditional health care delivery systems, and to introduce a more water-centric, locally connected, and sustainable model. This includes introducing a new way in which practitioners should view systems building.

This paper describes how supply chains management and logistics are crucial factors in the effective delivery of health care, as well as how to conduct meaningful research and monitoring and evaluation of interventions to expand services to water-based communities. Equally crucial, is how cultural and regional factors should inform design to help deliver empathic care that instills trust and comfort in patients/clients rather than fear and suspicion.

Our approach addresses both the immediate needs and long-term challenges of vulnerable populations in water-based communities. We take into account Adeyemi and Adjaye's systems building design theories, and apply our knowledge of health care as physicians and logisticians who have served in resource poor, underinvested water-based communities. We look through the lens of the Lake Tanganyika Basin to highlight the challenges water-based communities face, and how a redesigned health system using our proposed principles (which take into consideration the people the system is supposed to support, methods of service delivery available, and geographic constraints), could positively impact water-centric populations.

WAVE's concept of a hospital ship is the organizing principle for a redesigned health system in the Lake Tanganyika Basin. We are bringing new ways of working, new thinking, and new energy to this neglected region by using the lake as the main access point to the populations living there. Over 12 million people living in the Lake Tanganyika Basin are geographically very isolated due to the mountainous terrain and poor or non-existent road and communications infrastructure. Lake Tanganyika has over three and a half million people from four riparian countries who live directly along the lakeshore and who are cut off from their respective health systems. They make up a unique epidemiological unit and share more in common with each other than with their respective nation states largely due to their shared dependency on the water for their livelihoods, barriers to accessing services, similar health conditions, and population intermixing.

We plan to build a state-of-the-art hospital ship that provides education, information and medicine to the communities with the support of an international work force in the lake basin. Our vessel will serve as a regional referral hospital for the four riparian countries bordering Lake Tanganyika to create a functional healthcare system using water as the method of transport and supply chain access where there previously was none. This hub and spoke model assists the health centers and dispensaries fulfill their roles of providing community primary care.

Currently, health care along Lake Tanganyika is provided by tiny, government-run dispensaries/health centers that are poorly supplied and often staffed by a single health care worker without sufficient training. Many dispensaries have no road access, no running water, no electricity and no telecommunications services. This leaves them unequipped to handle common health problems along the lake, such as cholera outbreaks, surges of malaria during the rainy season, and obstructed labor, resulting in thousands of preventable deaths. The nearest regional referral hospital is, on average, more than 90 km away over poor or non-existent roads, and accessibility is highly dependent on how recent rainfall has affected the road quality. Using the lake as a means of transport is far more reliable, so health care workers describe the prospect of water-based tertiary care as ideal.

WAVE's floating hospital will provide expert specialty and surgical care that is easily accessible by water and also provides a training ground for local staff. When it comes to provision of reliable, high quality tertiary care as well as a platform for operational and scientific research on Lake Tanganyika, there is no existing solution that is comparable to the hospital ship we are planning to build. The current model of land-based regional hospitals is fraught with challenges, including supply chain failure and inaccessibility due to long distances between locations and poor road infrastructure. The upfront cost of building a hospital ship would set the stage for decades of improved care for millions of people living in the basin, as well as serve as a catalyst and platform for other forms of development.

WAVE's concept of a hospital ship is the organizing principle for a redesigned health system in the Lake Tanganyika Basin.



WAVE's water-based health care model is applicable in other water-centric communities with similar health challenges as the Lake Tanganyika Basin, including vulnerable populations living in the Mekong River Basin (China), the Ganges-Brahmaputra-Meghna River Basin (India / China / Nepal / Bangladesh / Bhutan), the Amazon River Basin (South America), the Lake Victoria Basin (Tanzania / Uganda / Kenya), Lake Volta (Ghana), Tonle Sap (Cambodia); the Congo River (DRC); and population-dense water-based cities such as Lagos (Nigeria), Cairo (Egypt), Ouagadougou (Burkina Faso), and Maputo (Mozambique).

Conclusion

New challenges in the 21st Century, such as water scarcity, climate change, population movements, and increased demand on resources, are forcing policy makers to approach humanitarian and development practices differently.

Health systems design should not only be about “strengthening” features of health system models, but rather the models themselves should be redesigned to evolve with societal and environmental changes. More nuanced approaches to scale the impact of health care outcomes should be integrated into health systems models, and the concept of “scale” itself should be reimagined. We believe health systems models should be defined by region – incorporating the unique characteristics of those regions – and should focus on logistics and supply chains, culture, and environmental factors, in order to sustain positive outcomes.

As the international community deliberates Sustainable Development Goals (SDGs) this year to improve the livelihoods of billions of people in developing countries over the next 15 years, it is imperative that health systems and service delivery approaches are revised and included in the formation of these global priorities. In order for the SDGs to successfully complete the unfinished business of the Millennium Development Goals and respond to new challenges, our approach must change in radical ways.

A new model of systems building to support development goals in the post-industrial era is long overdue. Uncertainty permeates development policies in a world with increasingly complex environments and resource challenges. Resilience design is the keystone for future systems building. It is the only rational and cost-effective approach to address the needs of and the dynamic interactions between human beings and natural resources to ensure a more sustainable existence on Earth.

¹ Oceans, Seas, Coasts Indicators: Population Living in Coastal Areas, United Nations, 15 June 2007, <www.un.org/esa/sustdev/natlinfo/indicators/methodology_sheets/oceans_seas_coasts/pop_coastal_areas.pdf> (15 October 2014).

² Cicin-Sain, Knecht, Foster, Trends and Future Challenges for U.S. National Ocean and Coastal National Oceans, National Ocean Service, University of Delaware Center for the Study of Marine Policy, Ocean Governance Study Group (U.S.), National Oceanic and Atmospheric Administration, 1999,

<http://oceanservice.noaa.gov/websites/retiredsites/natdia_pdf/3hinrichsen.pdf> (February 2015).

³ Key Components of Well-Functioning Health Systems, World Health Organization, 2010, <www.who.int/healthsystems/EN_HSSkeycomponents.pdf?ua=1> (February 2015).

⁴ Knippenberg, H., Markusse, J., Nationalising and Denationalising European Border Regions, 1800–2000, Kluwer Academic Publishers (1999).

⁵ Adeyemi K., Adekola A., Shaping the Architectures of Developing Cities, An NLE Publication, Amsterdam, Netherlands (2014).

⁶ Adjaye, David, “The Future of African Urbanism,” Zeitgeist Africa, 19 March 2013, <www.zeitgeistafrica.com/places/the-future-of-african-urbanism-by-david-adjaye-obe> (January 2015).

⁷ Adjaye, David, “Contextualizing Approaches to Urbanization,” Huffingtonpost.com, 10 December 2014, <www.huffingtonpost.com/david-adjaye/contextualizing-approache_b_6304806.html> (January 2015).

⁸ Aslaksen, Bergh, Bringa, Heggem, Universal Design: Planning and Design For All, Cornell University ILR School, GLADNET Collection, DigitalCommon@ILR, December 1997, <<http://digitalcommons.ilr.cornell.edu/cgi/viewcontent.cgi?article=1329&context=gladnetcollect>> (March 2015).



Lake Tanganyika is a lens through which the interconnectedness of the modern world can be viewed.

- The longest and second largest lake in the world, holding a fifth of the world's available fresh water;
- Over 12 million people depend on the lake as a food and economic source, and live in extreme poverty with little access to health care systems;
- 1,900 km shoreline, sustains some three million people living on the lakeside;
- Population growth rate is 3%, one of the highest in the world;
- Maternal and under-five mortality rates are among the highest in world; many of these deaths are preventable;
- Extremely high rates of malaria and diarrheal diseases;
- Bordered by four countries;
- One of the last genuinely untouched biodiversity hotspots with 1,500 species, half of which are native to the basin;
- Helps sustain the world's "second lung" – the Congo Basin forests;
- Western shore abounds in industrial minerals;
- Massive oil and gas reserves;
- Limited cell-phone coverage;
- Hazardous or non-existent roadways;
- A region where more deaths have occurred than the Rwandan genocide by a factor of five.



Source: International Lake Environment Committee

About Lake Tanganyika Floating Health Clinic

The Lake Tanganyika Floating Health Clinic (LTFHC) is an international NGO whose goal is to create healthcare infrastructure and provide health services to the 12 million acutely impoverished people living in the Lake Tanganyika Basin, one of the most remote regions in the world.

The LTFHC has a very diverse staff base which enables it to provide medical care and collect unique information from the field in this remote area. Medical and logistical experts work alongside former child soldiers, refugees from multiple backgrounds, tribes, and factions in the Great Lakes region.

Recognizing the complexity of the region, the LTFHC has mobilized itself to engage on policy, legislation and technologies that promote effective development, transparency and ensure the safety of Lake Tanganyika's populations.



Get Involved

The LTFHC is ready to work with organizations that are issue-based or project-based, providing a range of data, knowledge, expertise and the capabilities to help global and local initiatives succeed.

To find out more about our work on Lake Tanganyika, talk to one of our staff or receive our full brochure, please make contact now.

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