08

Family Planning for People and Planet

A POPULATION, HEALTH, ENVIRONMENT APPROACH IN THE LAKE VICTORIA BASIN

This anthology is a project of the Planetary Health Alliance (planetaryhealthalliance.org). The Planetary Health Alliance is a consortium of over 200 partners from around the world committed to understanding and addressing the human health impacts of global environmental change.

Case studies were written and photographed by Hilary Duff with editing and support from Amalia Almada, Christopher Golden, and Sam Myers. Teaching guides were written by Carlos A. Faerron Guzmán.

Please cite this case study as “Duff H., Faerron Guzmán, C., Almada, A., Golden, C., and Myers, S. “Family Planning for People and Planet: A Population, Health, Environment Approach in the Lake Victoria Basin.” Planetary Health Case Studies: An Anthology of Solutions. 2020; https://doi.org/10.5822/phanth9678_8

To access the full Planetary Health Case Studies: An Anthology of Solutions, please visit https://www.planetaryhealthalliance.org/case-studies

Executive Summary

Topics of population growth and the beneficial roles of providing girls education, women's economic opportunities, and access to contraception for couples are explored in depth in chapter 3 of ↘ Planetary Health: Protecting Nature to Protect Ourselves.

Learning Objectives

After reviewing this case, students should be able to:

① Explain how population growth, poor resource management, and health are intertwined.

② Analyze how the historical and socioeconomic contexts can determine the health of ecosystems and humans.

③ Assess how gender, economic, and other power dynamics shape planetary health challenges.

④ Appraise the utility of the PHE approach.

⑤ Design population-wide interventions to address planetary health challenges with scalability and sustainability in mind.

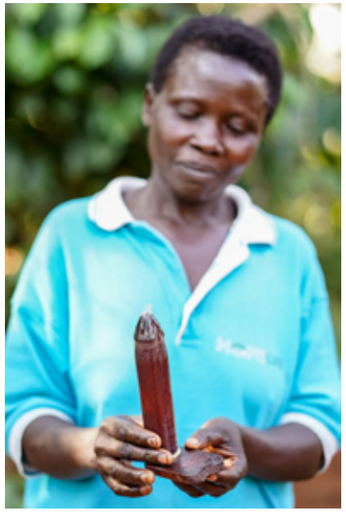
This case study illustrates the relationship between population, family planning, community health, and the sustainability of natural resources in the Lake Victoria Basin, the largest lake basin on the African continent. It demonstrates how these dimensions are shaped by many factors, including human-caused alterations to the lake, access to sexual and reproductive health services, and environmental degradation.

The case analyzes the effectiveness of addressing these challenges using an integrated approach called PHE. PHE stands for population, health, and environment. Since 2012, Pathfinder International's Health of People and Environment in the Lake Victoria Basin (HoPE-LVB) has been a flagship PHE project in the region. Its approach has three arms: (a) increasing education and access to the tools that help with healthy timing and spacing of children (population); (b) improving sexual and reproductive health, in addition to sanitation and hygiene standards among families (health); (c) supporting the shift to sustainable fishing and agriculture (environment).

Using these three arms of PHE, Pathfinder's project in Uganda and Kenya has demonstrated why a comprehensive approach is necessary to address the Lake Victoria Basin's complex suite of problems. With a focus on policymaking, advocacy, and institutionalization of best practices, HoPE-LVB is a model for how district, national, and regional bodies can adopt multi-sectoral PHE approaches in their work.

This case study is based on interviews conducted on Bussi Island, Zinga Island, and Kampala (Uganda) as well as Nairobi, Kenya in September and October 2018.

Introduction



Namakula Edith, a Village Health Team member on Bussi Island.

In East Africa, the shade of a tree provides an informal meeting place. This afternoon, there is a gathering of a half dozen young mothers. Namakula Edith, a sprightly 47-year-old who looks a decade younger, is convening. And today, she's brought props. Reaching into her family planning kit, Edith pulls out blister packs of birth control pills and rattles them in the air. But the real fun begins when it's time to talk condoms. Edith doles out a few to the women sitting tentatively on the benches around her and searches through her envelope for a slightly more phallic prop. For demonstration purposes, of course—though it draws giggles from the surrounding women and a double take from passing motorbike drivers.

Contraceptive methods and family planning are the main topics of conversation today, but the meeting also touches on the connection between family size, health, and the environment. It's a concept referred to as Population, Health, Environment (PHE). Edith finds the approach is best explained with an easy-to-grasp example. In an island village like Seeta where Edith and the women live, it makes sense for that story to start with a fish.

"Think of the resources your family needs," Edith says. She means the food, firewood, shelter—everything essential to a family's basic survival. "If the father brings one fish and he has 10 children, it means the fish will not be enough," she explains. "If you are many, you use a lot of things." She goes on: "if there are fewer children, then you will need only one piece of fish to provide nutrients for your home, and the rest of the money can go towards education and healthcare. You will have fewer children, but you will be able to support them better," she says. "And because there are fewer people at home you will not need to collect as much firewood to cook that fish, so the forest will be better maintained. Making the decision to use family planning to time the birth of your children conserves the environment around you. Your fish goes further, and so does your family," Edith says. These are the first messages Edith uses when talking to her peers about PHE. It may be a simplification of the linkages between family size, health, and the surrounding environment, but it's a start.

Edith and these women live on Bussi Island in the Ugandan portion of Lake Victoria. It's here where Edith serves as a member of the Village Health Team (VHT), a group of government-hired community volunteers who provide the bridge between villages and government health clinics. Accessible only via an hour-long motorboat ride from the mainland, Bussi Island is one of four focus areas for the Health of People and Environment in the Lake Victoria Basin (HoPE-LVB) project in Uganda and Kenya. A project of Pathfinder International,[i] a long-running sexual and reproductive health NGO based in the United States, HoPE-LVB is an example of an internationally-funded project that has been proven to support positive behavioral, environmental, and policy changes at regional, national, district, and local levels. In the case of this project, local gets really personal—into the homes and bedrooms of families across the region.

[i] ↘ Learn more about Pathfinder's work here

One of the wooden motorboats that transport people from the mainland and serve as commuter boats between Lake Victoria's islands.

Just as planetary health examines how human health and the spread of disease are influenced by human-caused disruptions to the Earth's natural systems, PHE also looks at the health of people and the environment.

"The planetary health concept can be strengthened even further when it includes addressing women and men's sexual and reproductive health rights," write[1] Suzanne York and Robert Engelman, two PHE experts. York is the Director of Transition Earth and Engelman is a Senior Fellow at the Population Institute. "If couples were empowered to make their own reproductive choices, and provided with the means to choose the number and timing of their pregnancies, the resulting impact on human fertility would powerfully alter future trajectories of population growth and its environmental impacts, while also adding to the health and well-being of families and communities," they continue. The HoPE-LVB project takes this rights-based approach[ii] to family planning, providing couples with the knowledge, access, and choice to plan for the timing and spacing of their children.

The "population" dimension of HoPE-LVB includes voluntary family planning and contraceptive information sessions for women and men alike. Health-wise, the project has worked to ensure women have safe pregnancies and childbirth and more recently, has aimed to reduce rates of mother-to-child HIV transmission.[iii] The health element also addresses minimizing disease through improved household hygiene and sanitation, and reducing the risk of respiratory conditions through the construction of energy-efficient clean cookstoves. Finally, the "E" in PHE talks about the importance of, and the best ways to, conserve the environment. That ranges from adopting sustainable fishing and agricultural practices, to diversifying livelihoods to reduce reliance on any one natural resource.

While the dimensions of PHE can be defined separately, a key element of this approach is recognizing the linkages that exist among the three—how demographic trends and poor access to sexual and reproductive health affect the environment, how the changing environment affects health, and so on. The goal is to create an integrated solution that considers the complex everyday realities of people, including barriers of poverty, culture, and health access.

[ii] What is the rights-based approach? Can you think of other examples where this approach is used?

According to the organization Family Planning 2020, human rights-based family planning approaches support the right of all individuals to "choose whether, when, and how many children to have; to act on those choices through high-quality sexual and reproductive health services, information, and education; and to access those services free from discrimination, coercion, and violence." More information can be found in this resource guide.

[iii] What is the burden of HIV in Uganda? ↘ Learn more here

Lake Victoria in the Anthropocene

Lake Victoria is the largest freshwater lake on the African continent. Its shores connect Uganda, Kenya, and Tanzania, and its catchment area extends to include the countries of Burundi and Rwanda. Today, the Lake Victoria Basin (LVB) is an integral part of the economy and culture of all five East African countries. An estimated 44 million people live in the LVB, and despite making up less than 10% of the land area, the region is home to a third of the people living below the poverty line in the East African Community (EAC).[2]

Lake Victoria's positioning in the region presents several environmental and health challenges. In addition to being a transboundary ecosystem with management subject to the political will and cooperation of multiple countries, the LVB's residents are also unique. "These are people who do not seem to belong to any country," explains Doreen Othero, the Regional Programme Coordinator for the Integrated PHE Programme of the Lake Victoria Basin Commission, an institution created by EAC to oversee the sustainable development of the region. "The people living here cross borders, do their business, and then return home."

A landing site on Lake Victoria. These sites connect people who live on islands like Bussi with the mainland and other island communities. Sometimes described as an inland sea due to its immense size, Lake Victoria is essential to the health and livelihoods of millions of people living in five countries.

That transience is because of the region's primary industry: fishing. Home to valuable ecosystems and essential natural resources, along with a rapidly growing population, the LVB sits at the crux of many human health, environmental, and economic challenges. Nothing new, the anthropogenic threats facing Lake Victoria started decades ago.

A Colonial Past and the Demise of Lake Victoria's Biodiversity

A small aquarium sits near the Ugandan shores of Lake Victoria. Follow the mechanical whir of the filtration systems and you'll come across a rectangular room, walls lined with some dozen tanks, each containing a common type of fish found in the nearby waters. The invasive fish species that has forever altered the ecology of the lake sits unassuming in a tank on the left side of the room: the Nile perch (*Lates niloticus*). While the one in this tank is only a half-meter long, fish of up to two-meters in length have been fished from Lake Victoria.[3] YouTube videos show fisherfolk hauling huge Nile perch from their boats, the fish hoisted over their shoulders.

The Nile perch was an introduced species to Lake Victoria. Its effects on the ecosystem have been well documented by scientists, including the ones working in the buildings surrounding this particular aquarium. The aquarium is in the town of Jinja, and the researchers work with the National Fisheries Resources Research Institute (NaFIRRI), a semi-autonomous Ugandan government agency that has long had its finger on the metaphorical pulse of the lake.

The National Fisheries Resources Research Institute (NaFIRRI) aquarium.

The introduction of Nile perch to Lake Victoria came first through a secretive release by the Uganda Game and Fisheries Department as early as 1954. Dozens more individual Nile perch were introduced from Ugandan and Kenyan shores over the following decade.[4] The introduction of Nile perch favored the interests of the British colonial forces who controlled Uganda, Kenya, and Tanganyika (present day Tanzania) until the countries gained independence in the early 1960s.

The premise was that Nile perch would provide ample catch for sport fishing, while serving as a predator for hundreds of endemic but small haplochromine cichlid species. The British administration deemed these cichlids "trash fish,"[5] and thought they'd be much better utilized as the primary diet for Nile perch, a species with a higher commercial value.

Two decades later, the Nile perch population exploded. "All of a sudden whenever fishermen would cast their nets they were seeing a fish they had never seen before. It took over the space in the lake," says Winnie Nkalubo, a fisheries biologist with NaFIRRI. The difference in total annual fish catch was notable: the size of the fishery increased by a factor of five between the early 1970s and 1989.[6]

Illicitly introduced into Lake Victoria in the 1950s, the Nile perch has had a significant impact on the lake's ecology.

Commercial processing factories soon cropped up along the shores of Lake Victoria, intensifying fishing pressures. Those factories were responsible for preparing catches of Nile perch for mass export to Europe and the Middle East—the first time Lake Victoria fish were sold internationally. Previously, the fishery had provided subsistence food for local and regional markets, and had been a resource used in pre-colonial bartering systems.[7] [8]

Perch and Population

The expansion of the Nile perch market in the 1980s and early 90s attracted a gold rush-style migration to Lake Victoria. "The population pressure pushed fish stocks to the lowest level, but fishers were still in business and had to switch to illegal nets," Nkalubo says. Illegal nets had a finer mesh, and could be used to catch younger, smaller fish. "There was an open access policy on the lake, so there was no regulation that limited the number of fishermen," Nkalubo adds.

"In terms of economics, the introduction of the Nile perch was a blessing," adds Herbert Nakiyende, another NaFIRRI fishery biologist. By the 1980s, it's estimated the economic value of the fishery increased fivefold.[9] During that time, people living along the shores of Lake Victoria benefited from the fishery. It improved incomes, brought infrastructure to the region, and created jobs at new processing factories. Local fisherfolk could sell their catch to factory middlemen while still having enough to feed their families.

"But for conservationists [the introduction of Nile perch] was obviously a curse since we had so many extinctions," Nakiyende expands. It's estimated that the feasting of Nile perch contributed to a 63% decline in the number of the lake's haplochromine cichlid species between 1960 and 2010.[10] Today, memory of those fish is found only at NaFIRRI, in a small building that bears the slightly tragic name "museum." Inside, jars of formaldehyde-preserved fish are stacked on floor-to-ceiling shelves—species that currently populate Lake Victoria, and the ones that were made extinct by Nile perch.

Jessy Lugya, a research assistant in fish biology at the National Institute for Fisheries Research (NaFIRRI), inspects the jars of now-extinct haplochromine cichlid species. The introduction of the Nile perch extinct an estimated two-thirds of the small fish living in the lake.

The economic bubble created by the Nile perch boom soon burst. The European Union slapped export bans on Lake Victoria fish between 1997 and 1999 due to traces of salmonella, cholera, and other hygiene and chemical concerns.[11] Some processing factories experienced an estimated 75% reduction in operations during these bans.[12]

Despite temporary export bans, local and regional demand remained. Fisherfolk who had migrated to the LVB during the boom continued fishing, and it became clear there was a decline in fish stock. Nile perch biomass declined nearly 10-fold from 1.9 million tons in 1999 to 200,000 tons in 2008.[13] Since then, the biomass of Nile perch has recovered slightly. And yet, only 5% have reached the stage of maturation where they can breed,[14] indicating that fish stocks will continue to be limited.

With more than 800,000 people[iv] relying on Lake Victoria's fishery for direct employment and stocks declining, fisherfolk increasingly turned to illegal methods to capture what fish remained.[15][v] These illegal methods included the use of small hooks and finer-mesh monofilament nets to capture younger Nile perch that hadn't yet reached full maturity. Catching smaller fish comes with short-term gain as they can be sold at the local market. The long-term effects on the ecosystem are more dire, and interfere with reproduction and the natural replenishing of the lake's perch population.[16]

The decline in fish stock also meant fisherfolk had to go further from shore to reach their catch. This increased the travel of an already transient population. The biodiversity of the lake and its ecosystems were at-risk. It was obvious that the lake's natural resources were key to maintaining livelihoods and food security—at the same time, the protection of ecosystems also affected human health.

Fish Catch and the Rise of HIV

As Lake Victoria was experiencing the ups and downs of Nile perch supply, the region was also seeing a rise in something more ominous—the prevalence of HIV/AIDS.[vi]

The first case of AIDS in the Lake Victoria region was reported in 1982 in a fishing village in southwestern Uganda.[17] Prevalence of the HIV virus that causes AIDS continued to rise in the region, with first cases reported the following year in Tanzania, and the year after that in Kenya.

Isiah Kisiki remembers this time well. Born on Bussi Island, he's one of the few people who grew up on the island rather than arriving as a result of the temporary boom in Nile perch supply. He recalls how people started to behave when fish stocks declined: "A lot of fishermen started fighting. Prostitution increased, domestic violence, and more drunkenness, too," he says. When it came to the spread of HIV, Kisiki remembers that many people came to the island as a way to isolate themselves. But it didn't work like that. Fisherfolk were traveling further and more frequently to get the same amount of fish. Many were living unknowingly with HIV, and would unwillingly pass the virus among multiple sexual partners across various parts of the lake.[vii] Kisiki says a reduction in fish stock also had detrimental environmental effects: "People had little revenue coming in from fishing and started to cut trees to burn for cooking and to sell as firewood."

Isiah Kisiki is a lifelong resident of Bussi Island. This is what fishing on Lake Victoria looked like when he was a child—before the population boom of the Nile perch, introduction of HIV-AIDS, and eventual collapse of the fishery.

Fishing communities have always been one of the groups most vulnerable to the transmission of HIV/AIDS. While 18% of Uganda's general population was infected at the peak of the infection in 1992,[18] epidemiologist and former director of the country's HIV/AIDS Control Program, Dr. Alex Opio, estimates that prevalence

[iv] How many people worldwide depend on fish as a main source of income or dietary protein? How about in your country of origin?

[v] What are some of the illegal fishing methods that fisherfolk can use to increase their catch?

[vi] ↘ Here is a timeline on global HIV infection since it's origin in the 1980s.

[vii] What other conditions back then, and even today, fueled the HIV epidemic?

could have been as high as 30% on island and fishing communities during the same period. The first survey to quantify the rate of HIV prevalence in island communities did not happen until 2011. Opio and his co-authors found the rate in island communities to be 22%—more than three times higher than the 6% prevalence found in the general population.[19][viii]

[viii] ↘ Take a look at this link with global distribution of HIV burden of disease

A reason for the increased occurrence is the lack of physical access to health services, coupled with the nature and culture of fishing communities. "It was very apparent that the islands were lacking health facilities," says Opio. More often than not, fishing communities are serviced by outreach or mobile services, as opposed to a dedicated health post. The frequency of travel by fisherfolk made it more difficult still for HIV awareness messaging to be communicated and treatment offered. "So fishermen had no knowledge or health access if they did contract the disease, making transmission rates higher," Opio says.

High prevalence rates were paired with risk-taking behavior. Fisherfolk, Opio says, don't live in isolation—they come to an island knowing there's fish, and they leave their family somewhere else in the country. "They do their fishing at night and by 9 a.m. they've sold their catch and have money," he says. "Then they would often either go to sleep, drink alcohol, or have affairs with the commercial sex workers who go to the island."

Two men untangle a fishing net after unloading the day's catch. The mesh size on this net is legal, though there are many fisherfolk in Lake Victoria who use smaller meshes, pulling in adult-sized fish while disrupting the growth of those that haven't yet reached breeding maturity.

Compounding that spending culture is the fatalistic attitude held by many fisherfolk. "Fisherfolk see their risk of mortality coming from different sources," Opio explains. "They see people dying of HIV, but they also regularly see other fisherfolk drown. They would say 'if I can survive the rough waves of water, what about this HIV?' To them, the risk of dying from infection was much less than the risk of dying while on the lake." This fatalism translated to a resistance towards using condoms, as well as a lack of urgency to protect natural resources. Survive and catch fish on the lake today—worry about tomorrow, tomorrow. It's a culture that's still prevalent in island communities today.[ix]

[ix] This is a perfect example of how gender and gender roles can determine health and disease. Can you think of other examples? Think about where you live—does gender determine your health?

Healthy People, Healthy Planet

There are many linkages demonstrating how the protection of Lake Victoria's ecosystems can benefit human health. The same is also true in reverse, and was a topic explored in a 2017 paper authored by Dr. Kathryn Fiorella and her Cornell University research group. That study quantified how human health and well-being in the Kenyan portion of Lake Victoria influences the capacity of people to sustainably manage their natural resources.

The findings directly contradict a common hypothesis: that sick people have less of an environmental impact. "By this logic, ill people reduce the time and effort that they put into extractive livelihoods and, thereby, their impact on natural resources,"[20] the paper reads.

Fiorella and her team found a more complex story. The study demonstrated that a fisher's mental and physical health had no effect on the total hours fished per month, the number of nights spent away, or the income per hour fishing (a metric of fishing "success"). People who were sick were fishing just as much as when they were healthy. Poor physical health did, however, influence the choices people made around fishing methods and fishing location. Fisherfolk with poor physical health were 69% more likely to use an illegal method in inshore fishing areas—closer to shore locations that often served as habitat for smaller, easier-to-catch fish. Sick people were still fishing, but in even less sustainable ways.[x]

↘ *Appendix 1: Figure 1 from Fiorella et al 2017 PNAS Fishing and Morbidity*

A man fishes for Nile perch and tilapia near the shores of Lake Victoria.

[x] Why do you think this was the case?

"In contrast, methods used by physically healthy fishers require fishers to reach deep water or fish overnight to target the more sustainable mature Nile perch and *dagaa*[xi] fisheries," Fiorella and her team write.

Lake Victoria's fishery is male-dominated, but it's not only the health of men that affects the sustainable use of natural resources. Nor is it only men who are impacted by the negative side effects of ecosystem destruction. Illegal fishing practices and the unsustainable management of the fishery can lead to increased vulnerability for women (see textbox 1). Poor health is just one factor that contributes to destructive fishing practices.

As illustrated in appendix 1, those fishing practices can impact family food security and livelihoods—less fish means less for families to eat. It can also increase reliance on other natural resource-based livelihoods such as charcoal-making and farming. If done unsustainably, those activities can lead to deforestation or damaging agricultural practices. Natural resource degradation and food insecurity can then increase illness, which again fuels the cycle of poor health and unsustainable natural resource use.[xii]

[xi] *Dagaa* (Rastrineobola argentea) is the Kiswahili name for the small, sardine-like fish found in Lake Victoria. Fisheries researchers attribute the rise in *dagaa* biomass to the decline in Nile perch stock, as *dagaa* was released from competitive pressure with the demise of the cichilds. Food preference-wise, it is considered less valuable than Nile perch or tilapia, as there exists a culture of eating larger table fish. The *dagaa* fishery could, however, be a way to make the lake's fishery more gender equitable, as women play a larger role in the harvest, drying, and selling of *dagaa* versus traditional Nile perch.

[xii] Can you think of other examples of this "negative cycle"?

Gender Dynamics in the Lake Victoria Fishery

The introduction of Nile perch and declining fish stocks exacerbate the inequitable gender dynamics that exist in Lake Victoria's fishery. Traditionally, men are the ones who fish, selling their catch at the shore to women who manage the processing, transportation, and sale of those fish. The role of women in the fishery shifted after the introduction of Nile perch with the rise of larger packaging plants to prepare the fish for international export. To this day, women are primarily excluded from the more lucrative Nile perch market and instead take on the responsibility of drying and trading *dagaa*, a small, sardine-sized fish that has become populous in the lake. They also locally trade and process undersized Nile perch.

A 2015 paper authored by Dr. Kathryn Fiorella and her research group investigates how declining fish catch affects women. In Kenya, she found many women exchange sex for preferential access to fish.

Whereas periods of high catch means fish is plentiful and can be purchased using money alone, a declining stock means women have to compete for catch using non-cash methods. This has affected *jaboya* relationships—the Luo word used to describe fish-for-sex. Transactional sex relationships like *jaboya*, are different than sex work. They are often with a regular partner and include other benefits such as housing and emotional support.[21] *Jaboya* transactions typically involve a woman exchanging sex with a man in order to gain preferential access to purchase the fish he has caught. While women are conventionally excluded from the Nile perch economy, and standard prices are set by fishery managers, fish-for-sex transactions introduce the opportunity for a non-monetary bargaining chip. *Jaboya* relationships have existed for several generations due to the transient nature of the fishing industry, though exchanges are now being altered by fluctuations in Nile perch and *dagaa* catch.

These transactions are among the many factors that have contributed to higher-than-average HIV rates in the Lake Victoria Basin.

Finally, physical health and well-being hinges on gender equity. That includes women having control over their reproductive health (the ability to access contraception, avoid diseases, and safely plan for and deliver children). Removing a woman's right to make decisions about her sexual and reproductive health and limiting her bargaining power within economic systems has a negative impact on her welfare. That, in turn, has a similar impact as a sick fisherman: the unsustainable use of natural resources.

As demonstrated by Fiorella's research, environment and human health feedback loops are complex. Environmental conservation cannot be done without considering the health and well-being of the people who rely so heavily on the services provided by those ecosystems. Any project that wanted to improve the outcomes of one would have no choice but to integrate the other. This was the context in which the HoPE-LVB project began.

The Need for an Integrated Solution

[xiv] What's the population density where you live?

The African continent has a population density of 36 people per square kilometer. Urbanization compounded by birth rates, however, has meant that Africa's most populated cities have dramatically higher population densities. Take Cairo, Egypt (population: 19.5 million, population density: 19,376 people per square kilometer) and Kinshasa, Democratic Republic of Congo (population: 9.4 million, population density: 19,900 people per square kilometer).

[xv] Population Research Bureau data says Ugandan women of childbearing age give birth to an average of 5.4 children, and that number sits at 3.9 children per woman in Kenya—both substantially higher than the global average of 2.4 children per woman.

The Lake Victoria Basin has long been shaped by changing demographics and population pressures. Even before the Nile perch boom of the 1980s, the LVB had a higher population density than the rest of the continent.[xiv] As of 2015, an estimated 246 people inhabit every square kilometer of lakeside in Uganda, Kenya, and Tanzania, compared to 45 people per square kilometer in 1960.[22] It's notable that in the case of Tanzania and Kenya, the population density in lakeside areas is two to three times higher than the density of the country at-large.[23] These demographic trends can be attributed to two key factors: an influx of in-migration to the fishery, particularly following the Nile perch boom, and birth rates that surpass national averages.[xv]

The result is 44 million people whose lives and livelihoods are intertwined with and dependent on a finite set of resources. While limiting in-migration to the region could be one way to mitigate natural resource pressures, Pathfinder International is addressing the issue through a rights-based PHE approach. The organization is ensuring that couples have access to contraceptive choice and sexual and reproductive health services. This empowers women and men to plan for the healthy spacing of their children, reduce the risk of contracting or infecting others with HIV, and live within the means of what their local natural environment can sustainably support.

Pathfinder and PHE

'Integration' is a word that comes up often among the Pathfinder International team. In this case, integration involves multi-sectoral project objectives: to conserve Lake Victoria's natural resources, improve the health and well-being of the people who live on its shores, and provide families access to sexual and reproductive health services. Add to the list a mission to combat traditional gender roles, advocate for greater healthcare access, women's economic empowerment, and institutionalization of PHE policies at various levels of government, and you have the organization's Health of People and Environment in the Lake Victoria Basin (HoPE-LVB) PHE project. If it sounds multi-faceted, that's because it is—but Pathfinder's belief is that complexity is the only way to address complexity.

Sono Aibe, a former Senior Program Advisor at Pathfinder, has been thinking about integration since her public health career

Namakula Edith, the volunteer team member with the HoPE-LVB project, holds up the packet of birth control she uses in her presentations with couples. Pathfinder isn't telling families to have fewer children. Rather, it gives couples access to the knowledge and tools they need to make decisions about the healthy spacing of children.

started in 1988. One of her first projects involved creating an integrated reproductive health, environmental sanitation, and maternal health project in the Philippines, a country long considered a leader in integrated PHE approaches. "Having come from that background made me a proponent for taking a broader view of sexual and reproductive health because women's lives are complex, and their problems are intertwined," says Aibe. While it would be possible to dedicate entire projects solely to managing and restoring natural ecosystems, family planning, or health, the premise is that it takes addressing all three to target the root causes of a region's challenges.

Pathfinder had already tested the waters of combining environmental and health programming by 2009 when Aibe was hired. Whether it was an HIV-focused project with a livelihood or agricultural component, or integrating HIV education and family planning, Aibe says she had an inkling that PHE programming was something Pathfinder could adopt.

What came next wasn't easy. "There definitely was pushback in the sense that people thought [PHE] would be a mission creep. They envisioned us having to work with environmental groups, share resources, and learn about conservation terminology and monitoring indicators. There was this whole anxiety around going into a completely non-health sector," Aibe recalls.

Another reason for Pathfinder's apprehension was that the "population" element of PHE has historically attracted controversy. "Some environmental groups still talk about problems of environmental degradation being because developing countries are growing too fast," Aibe says.[xvi] "That's a very harmful narrative for what we're trying to advocate for, which is reproductive health and rights, and the fact that a woman has to be given a full basket of choices and accurate information to make a decision about the number of children she wants. So there was this nervousness of 'are we going to be working with groups promoting the value of smaller families, which is diametrically opposed to the universal access to sexual and reproductive health and reproductive rights that we stand for.'" Aibe says she firmly believed the challenges of cross-sectoral work could be overcome by partnering with African communities to hear how people articulated the linkages (an echo of the "radical listening" discussed in the Health In Harmony case study).

[xvi] This narrative stems from what is known as neo-Malthusianism. Care to read more? Read Chapter 2 of Betsy Hartmann's *Reproductive Rights and Wrongs*.

PHE and Planetary Health

Sono Aibe and others in the PHE community say they view planetary health as a broad umbrella under which issues of human health and the environment can be discussed. "Initially when we were trying to join the conversation around planetary health it seemed skewed heavily towards climate scientists and more abstract issues that were very macro-level," Aibe says.

There was also concern that some would misperceive PHE approaches as accusatory—suggesting they were proposing family planning as a means to curb birth rates in lower income countries in order to protect areas of high biodiversity. Aibe says this is not the case. She reaffirms that PHE approaches advocate for individuals' sexual and reproductive health rights as opposed to prescribing the number of children families have.

Ultimately, planetary health and PHE approaches are working towards similar messaging: that integrated solutions and multi-sectoral collaboration are the best way to achieve the United Nations' Sustainable Development Goals. "[PHE] is an acknowledgement of direct connections between the reproductive health of individuals—women, men, and youth—along with the well-being of communities in remote, biodiversity-rich areas, and the health of the natural environment upon which all life depends," say Suzanne York and Robert Engelman in a blog post summarizing the topic.

Just as Aibe faced challenges in introducing the PHE concept to Pathfinder International, the country teams faced their own unique start-up obstacles with HoPE-LVB—namely, the need to work across so many sectors. According to Dorah Taranta, Project Manager for HoPE-LVB in Uganda, starting a PHE project meant the organization needed to find partners in sectors beyond health. That meant reaching out to ministries of all backgrounds: water and environment, agriculture, education, gender, and others. "It was really a learning project," says Taranta of HoPE-LVB. "We had all these activities and objectives based on the funding proposal, but then we had to fit in and achieve everything. Many times we came back to the drawing board to say 'what did we do right and what went wrong. Are we really doing integration or are we still different sectors working in the same room?'"

Taranta says there was a "whole shopping list" of indicators at the start of the project—nearly 35 points the team had outlined to measure the impact of the project. The challenge was creating indicators that demonstrated integration: how family planning lessons were being used in farming. How energy efficient cookstoves affected health and the environment. "It was about bringing best practices from one sector into the other and looking at how one affected the other," Taranta says. "Then we had to make sure the communities also understood it this way."

These integration needs meant HoPE-LVB was an iterative process. Partners from various sectors were brought on board and dropped if they weren't a good fit for the PHE approach; donors and their demands changed from phase to phase. "That calls for a lot of patience, especially when you're leading a project. You are like this small punching bag where everyone is saying 'we asked you for this,'" Taranta laughs, explaining that HoPE-LVB's approach would sometimes shift to satisfy donor and partner demands. "It's complex, but very interesting work."

A PHE Approach in Madagascar

A well-studied Population, Health, and Environment initiative is the work of Blue Ventures in Madagascar. Blue Ventures was founded as a marine conservation organization in 2003. Its first intervention was working with fishing communities to temporarily close a small area of their fishing ground to octopus fishing—octopus is a marine species that recovers rapidly with protection. Through the temporary closure and resulting recovery of octopus populations in these sites, Blue Ventures demonstrated to communities that they could generate quick profit by protecting their marine areas for a short period of time. It made a business case for locally-led conservation.

"Rather than international companies coming in and telling people who have fished off these coasts for generations that they can't fish anymore, we're turning this on its head—making marine management pay for coastal communities," says Vik Mohan, Blue Venture's Medical Director. "Protecting fisheries means better income for people, so they want to protect those areas." Similar to HoPE-LVB's advocacy towards community by-laws, this protection involved the creation of local regulations using dina, the name for customary Malagasy laws.

Blue Venture's family planning and maternal health program was introduced in 2007 in response to community members highlighting their unmet health needs—especially those linked to reproductive health. Maternal and child health was poor and couples were having more children than they wanted. Women and men were seeing the connection between their family size and depleting fish stocks. Today, family planning and other maternal health services are offered either by community support workers or through strengthened government-led clinics. Blue Ventures also partners with international organizations like Marie Stopes, USAID, and Population Services International to improve access to health services for the communities it serves.

For more information: Blue Ventures (www.blueventures.org)

[xvii] Take a moment to think through if a PHE approach is needed where you live and how it would be implemented.

When it came time to apply HoPE-LVB's PHE approach in the communities, the focal point of that integration was peoples' homes.[xvii]

A Model Household Approach

[xviii] The HoPE-LVB project works in two sites in Uganda and two sites in Kenya. In Uganda, it is Wakiso District (home to Bussi Island) and Mayuge District; in Kenya, the project operates in Siaya County and Homa Bay County.

Drive a motorbike along the red dirt roads of Bussi Island and you start to notice some key differences between households: a rubbish pit sitting at the edge of the property, a dish drying rack, a garden containing various crops and fruit trees, the size of which provide ample shade for homeowners and their guests. On Bussi Island and the other three lakeside regions where HoPE-LVB operates, [xviii] homes with these features are most likely model households—living demonstration sites that illustrate the project's PHE interventions.

A model household on Zinga Island, nearby to Bussi. The HoPE-LVB project encourages model households to intersperse food crops and other plants, creating shade and balancing nutrients. The small trough in the back of the garden is used to store excess rainwater.

The model household concept is not new. It has existed in past PHE projects outside of Pathfinder's work, as well as in other global health and development programs. What Pathfinder staff say is different is that the positive behaviors exhibited in HoPE-LVB model households protect human health and the environment in ways that are specific to the needs of Lake Victoria communities. "In PHE you need to look at what ecosystem you're conserving, what are the health issues of the people living around there, and what are the demographic issues in that area," says Dorah Taranta. Only then can a project address the intertwined pressures faced by that community.

A home visit is the best way to see a model household in action. Namuyaba Margaret and her husband, Kayemba Taddeo, sit on wobbly blue plastic chairs in the shade of their generously sized

mango tree. Margaret and Taddeo are one of four original model households in Gombe Village on Bussi Island, and the couple live with their five children who range in age from six to 17-years-old. The eldest, Helen, is kneeling off to the side, scrubbing aggressively at the family's laundry. Home visits are nothing new for the couple—one requirement of becoming a model household is an agreement to talk and tour neighbors and other officials so they can learn about the benefit of integrated PHE activities. The integrated nature of the model household was what originally appealed to the couple: "other projects came with only one intervention, but HoPE came with three: P, H, E," Taddeo says.

Namuyaba Margaret and her husband, Kayemba Taddeo, stand outside their home on Bussi Island. The brick building is where the family sleeps, and the wooden structure is the area where Margaret makes the family's meals.

It's hard to overlook the PHE interventions when you visit Margaret and Taddeo's property. Taddeo walks behind the red brick structure that serves as the couple's one-room home. Onions, tomatoes, and collard greens that go by the local name *sukuma* grow in the shade of a banana tree. Kitchen gardens are a feature of every model household, and ensure families have access to a healthy source of vegetables. Beyond the kitchen garden is a small shack, its walls made of worn wooden slats. Inside is the energy efficient cookstove where Margaret prepares the family meals. Training to build these cookstoves is offered by the HoPE project. Whereas cooking would typically be done over an open fire with less efficient means of burning wood,[xix] these clean cookstoves require only two to three branches per meal. The design of this particular stove funnels smoke outside the small cooking space, reducing the risk of cardiorespiratory disease caused by smoke inhalation[24] and the opportunity for cooking pots to spill on unsupervised children.[xx] This more efficient stove is also used by families to boil drinking water.

Outside the cooking area is a dish drying rack raised from the ground for sanitation purposes. Beyond, a latrine is located an appropriate distance from the home. Latrines are challenging to build in the sandy soils of Bussi Island, but HoPE-LVB links families like Margaret and Taddeo with government funding and other NGOs that focus on that specific infrastructure.

[xix] The HoPE-LVB baseline study found that 81% of households in its Uganda and Kenya sites relied on firewood as their main source of cooking fuel.

[xx] Worldwide, how many people cook with open fire stoves, and how many people cook with enhanced means?

What is the burden of disease due to this risk factor in Uganda and worldwide? ↘ Learn more here

One of the clean cookstoves that has been constructed as part of the HoPE-LVB project.

A tippy-tap in action.

[xxi] Can you list some examples of water-borne illnesses? Are they still prevalent where you live? If not, what measures are currently being taken to prevent them?

Access to clean cookstoves and improved household water, sanitation, and hygiene (WASH) standards are part of the health element of this PHE approach. HoPE-LVB's baseline study found that just 41% of people had access to a protected drinking water source. Lake Victoria filled the gap, and was the main source of usable water for activities like drinking, washing, cooking, and disposing of waste.[25] By 2018, six years after the baseline study was conducted, WASH standards had improved in sites across Uganda and Kenya, even in non-model households. This was due to the construction of new latrines and education around handwashing practices. These interventions reduced the risk of water-borne diseases in households. In fact, one Pathfinder publication noted that not a single HoPE-LVB model household in Uganda was affected during a 2015 cholera outbreak in the Lake Victoria region.[26][xxi]

While a latrine and other features of a model household require families to invest some of their savings, a USAID external review of HoPE-LVB noted that "some of the most important PHE outcomes are the least costly, with some requiring no up-front capital expenditure whatsoever. This is a valuable lesson of high applicability to other potential PHE sites."[27] One example is a low-cost innovation found outside Margaret and Taddeo's latrine. It's called a tippy-tap, and it's fashioned from an old jerry can, a piece of string, and a small stick. Taddeo steps gingerly on the stick and the string tips the bottle, enabling family members to wash their hands without touching a dirty surface.

Other interventions were low-cost because they related to behavior shifts rather than the creation of new infrastructure. "Before, people were only focused on earning money and didn't understand how to make the best decisions for their family's health," explains Jackie Nakajubi, one of two HoPE-LVB field staff in Uganda. Nakajubi focuses on health and family planning while her counterpart, Stellah Mbatudde, covers environmental conservation. "People would fish and sell everything because of the amount of money they could make. As a project we tried to ask them to start with themselves first, including when it came to eating fish," Mbatudde explains.

Changing Perceptions of Sexual and Reproductive Health

Other behavioral shifts related to family planning. "We used to think about planning our family but didn't know how," says Margaret outside her home. "We would hear the rumors about family planning, like that if I used contraception I'd give birth to a child with a defective brain. This scared us off, but the education we got from HoPE helped shed those fears." Margaret now takes birth control in the form of an implant, and the couple has chosen to not have another child.

Margaret is not alone in her contraception fears. Back in Seeta Village where Village Health Team (VHT) member Edith has finished demonstrating how to properly fit a condom over her phallic wooden prop, she's just opened the session to questions.

"Is it true birth control will sit undissolved in my stomach and cause a tumor?" asks one woman. Edith swiftly pops one of the pills from its blister pack and puts it in a cup of water. Moments later she passes it around, pointing out that the pill has dissolved into the liquid. The women nod their heads. Just as model households demonstrate the visible benefits that PHE can bring to a home, education around family planning requires the same level of learning by example.

Edith says regular educational campaigns are key in encouraging contraception uptake. "You go to church once, but you need to keep preaching the gospel," she explains. "So yes, I have trained these women on family planning before, but I need to continue training them. For example, you can't teach all four to five methods in one go, so each session needs to focus on a different method."

Beyond education, considering the religious beliefs of Ugandan and Kenyan communities is important. Both countries are deeply religious, with an estimated 85% of the population identifying as Christian. Across sub-Saharan Africa, religious leaders have a platform to share their message, and it isn't always one in favor of family planning. For example, one Catholic archbishop in Kenya started a campaign against contraception because he claimed it harmed women, was "unbiblical," and "encouraged unfaithfulness in marriage."[28] There's an audience for this kind of message: a 2014 poll found that 38% of Ugandans and 33% of Kenyans deemed contraceptive use immoral.[29] Another study done in Mwanza, a Tanzanian community on the shores of Lake Victoria, found

Nakajubi Jackie and Mbatudde Stellah are Pathfinder's field officers for the HoPE-LVB project in Uganda. While Jackie comes from a background in sexual and reproductive health and Stellah from one working in conservation, the two women regularly find themselves talking about both areas—that is the purpose of a PHE project, after all.

that religious tradition affected the way couples perceived family planning.[30] It was clear that the HoPE-LVB project had to tailor its approach to not only consider education around family planning, but religious beliefs as well.

Improving Access and Building Healthcare Demand

Once their misconceptions are debunked, HoPE-LVB has also made it easier for community members to access family planning methods. Almost half of pregnant women surveyed during the project's baseline study said they would have preferred to get pregnant later or not at all.[31]

Baseline data also found that less than 1% of respondents received their contraceptives from a community-based clinic or outreach service. This meant they had to travel to a public health center, often accessible only by motorbike or, on smaller islands, by traveling to the nearest large island. Despite short-acting methods of contraception[xxii] being provided for free at these centers, the financial cost of reaching them often restricted physical access. This was compounded by the fact that husbands wouldn't allow women to make solo clinic visits.

[xxii] Short-acting methods of contraception include the birth control pill, patch, and vaginal ring, all which involve the release of hormones.

One approach to these challenges might have been to open a series of HoPE-LVB facilities offering contraceptives. Rather, the project prefers to build the capacity of existing community groups for this role, and advocates for better services to be offered by government health facilities for long-term sustainability and country ownership.[xxiii]

[xxiii] This is an approach called capacity building, or health system strengthening, and it seeks to eliminate duplication of efforts, and provide long-term sustainability. ↘ Learn more here

In her role as a Village Health Team member, Edith is one of the community members who has received capacity training through HoPE-LVB. In isolated island communities like Bussi, VHT members are often the only public health professional women can see. Pathfinder offered VHT members 10-days of family planning training when the project began. Following that training, VHTs can distribute condoms and provide birth control to women who have already been given the medication by a trained health worker. They're also trained to offer follow-up and support—listening to a woman's concerns during contraception use or pregnancy and referring them to a health worker when needed.[xxiv]

[xxiv] Do community health workers exist where you live? What are their main roles?

The upgraded hospital on Bussi Island.

Advocacy-wise, the project wanted to provide families more contraceptive choice and guaranteed access. With short-acting methods of contraception available for free from the government—albeit with the previously mentioned access barriers—the second phase of HoPE-LVB successfully advocated at the district and national government level for free access to long-acting and permanent methods of contraception. That includes intrauterine contraceptive devices (IUCDs) and implants for women, and vasectomies for men. With this success, HoPE-LVB has offered thousands of Couple Years of Protection (CYP)[32] to families in Uganda and Kenya. It has also facilitated more than 118,000 visits to facilities and communities for contraception between 2012 and 2017.[33] Not solely used to help couples plan pregnancies, contraceptive use has also been linked to reduced maternal and child mortality and lessened risk of developing certain cancers. [34] Finally, HoPE-LVB also improved the health information management systems in each country to ensure government clinics always had a range of contraceptive methods in stock.

Pathfinder staff acknowledge these successes were possible because of their work with already-established government-formed groups like Village Health Teams. Partnering with existing groups was a strategic decision. "These groups have a common goal as to why they're together, so it's easier than picking individuals and forming a group here and there," says Stellah Mbatudde, the conservation field officer in Uganda. "If you form a group, it dissolves at the end

of the project, so we worked with existing ones for sustainability." It was also a matter of trust. Despite being Ugandan, project staff Jackie and Stellah were at first seen as outsiders from the capital city. "When people get someone of their own giving them testimony about family planning or fishing then they understand it better," says Jackie Nakajubi.

That community sensitization and working with existing groups is the way HoPE-LVB took on one of its most challenging tasks: deconstructing the traditional gender roles in which men normally dealt with natural resources and women with sexual and reproductive health.

Rewriting Gender Norms

Despite its place along the world's largest freshwater fishery, Kyanjazi landing site on Bussi Island is remarkably quiet. A half dozen wooden boats have been pulled onto the shore, paint peeling and faded in the equatorial sun. Fisherfolk stand around, cigarettes dangling as they untangle fishing nets and repair their boats. A man in knee-high rubber boots navigates his motorbike over loose sand. It's early in the morning, and yet the final packing preparations are already being done on the catch of the day. Taddwa Lawrensio picks up a two foot-long tilapia fish, his fingers pressing into the gela*tino*us eye sockets. Today's catch is meager. A large woven basket mounted on the back of a motorbike is all that's needed to carry the fish to another landing site where they'll be sold on Uganda's mainland.

Lawrensio is the chairman of Kyanjazi's Beach Management Unit (BMU). BMUs were created by the government in 2006 with the goal of curbing illegal fishing activity, protecting fish breeding zones, and training fisherfolk on sustainable practices. HoPE-LVB works with BMUs to encourage members to more sustainably use the lake's resources and diversify their economic activities. Perhaps unexpectedly, topics of family planning come up. By adopting this approach, the project offers positive reinforcement to the idea that men can be involved in the conversation around sexual and reproductive health and family planning, and that women can make decisions regarding the natural environment. Untangling these deeply entrenched gender norms is called a "gender transformative approach."

Taddwa Lawrensio at Kyanjazi landing site.

"Usually men would say these topics of contraception are for women," Stellah Mbatudde explains. Men would also say they were often suspicious about maternal health and the desired aims of family planning. "As fishermen we were not using family planning. We thought people were telling us not to give birth," says Lawrensio, staring out at the water. "Now we know women should go to safe delivery services which prevents our children from getting HIV." HoPE-LVB also works with Beach Management Units to provide boat fuel so women in need of specialized delivery services can easily reach mainland hospitals.

Project success wouldn't be possible without buy-in from both men and women. "For community level change, women are important pillars, but if you're not talking to men you won't change things because of the paternalistic nature of our societies," said one Pathfinder team member. Following the second phase of the project (2014-2017), model households in Kenya were 20% more likely to discuss the number and spacing of children, and in Uganda, it was a 34% increase. Three-quarters of families only started having these conversations during HoPE-LVB.[35]

Once men understand the importance of sexual and reproductive health, they become advocates who encourage and support women in their access to health services. This is a significant change from previous attitudes when men were reluctant to allow their wives and daughters to visit health facilities. In the past, health center visits may have come through referral from a Village Health Team member. Now, HoPE-LVB has created champions in men and other non-traditional groups. Health referrals from Beach Management Unit (BMU) members increased 43-fold between 2012 and mid-2014. Referrals also rose from farming group members over the same time period.[36] Further, a September 2018 internal review of the first and second phases of HoPE-LVB found that the number of women delivering babies in healthcare facilities had greatly increased, as did HIV testing and immunization for children under five. Health referrals from the traditionally male-dominated BMU and farming groups contributed to this rise in service use.

While Lawrensio received family planning training through his role with the BMU, HoPE-LVB recognized the need to start these challenging conversations in comfortable settings. That's where the project's campfire outreach sessions came in. Fire blazing and maize roasting, men would slowly approach the gathering and bring up topics of conversation—including questions about family planning that were then addressed by health workers in attendance. By pairing environmental conservation information with messages about healthy timing and the spacing of pregnancies, boys and men in HoPE-LVB communities showed increased knowledge about family planning.[37] And they were willing to talk about it with their friends and wives, too.

Education and social acceptability are two ways to increase access to maternal healthcare for women. Another is empowering women with greater agency, and raising the status of women within their communities and homes—something that has proven to have a positive impact both on families and the environment.

Consider Namudu Annet who, at 38-years-old, holds many titles in her village on Bussi Island: model household, leader of a young mother's group, BMU member, and mother of seven. Annet says the negative stereotypes that exist around the roles of women are beginning to change. So too are the places where women are allowed to speak up—while there were some female BMU members before HoPE-LVB started, she says a woman's place was still very much within the home.

Namudu Annet and a few of her children outside of their home on Bussi Island.

Annet hasn't always felt a sense of empowerment. Pregnant with her first child at the age of 16, she was expelled from her family's

home. “I was seen as an outcast and a waste in my family,” Annet says. “The boy who got me pregnant couldn’t look after me, and so I was a burden to his family and turned into a housemaid.” That relationship didn’t work out, and Annet moved to Bussi Island 18 years ago with her current husband.

Many of HoPE-LVB’s interventions empower women with the dignity and skills that Annet didn’t have as a young mom. Women get skills training for free, and then apply those skills to create a sustainable income-generating activity. “We gather young mothers together and teach them to immunize their children and other skills, like how to build clean cookstoves, make *mandazi* (a fried bread snack), and soap. That income means they don’t have to depend on their husbands,” Annet says. The scale of these income generating activities is notable: more than 25,000 energy efficient cookstoves had been built by women in Uganda and Kenya by the end of HoPE-LVB’s second project phase.[38][xxv]

[xxv] How would you define women’s empowerment? What different approaches would you take to achieve this goal?

“When our husbands realized we could bring income into the family, they started respecting us more,” says Annet. A USAID review of HoPE-LVB supports this claim—it found that the majority of respondents from Uganda and Kenya say their relationship with their partner had improved as a result of income-generating activities.[39]

Further, a woman’s access to sexual and reproductive health and rights is explicitly tied to her long-term ability to work. Studies have shown that female participation in the labor force among women aged 25 to 39-years-old can decline by 10 to 15% with each additional child.[40] Research into the value of HoPE-LVB’s PHE integration also found that women who earned additional income “frequently invested in sustainable income-generating activities, such as tree nursery management or beekeeping, in addition to other investments such as school fees.”[41]

Linked to the ability to work is a woman’s bargaining power within her home. Following HoPE-LVB, women have more freedom to engage in discussions about the sustainable use of natural resources. They are also more likely than before to become members of traditionally male-dominated spaces such as Beach Management Units, farming groups, and tree planting projects. Similarly, men have become more invested in sexual and reproductive health. But the question remained: do PHE integrations actually work?

Does PHE Integration Work?

Educating people to consider and value the connection between population, health, and their surrounding environment is one of the key objectives in HoPE-LVB’s theory of change.

Research supports and quantifies the effectiveness of the project’s integrated efforts. A 2018 paper authored by Samuel Sellers for *Environmental Conservation* looks specifically at HoPE-LVB’s four sites, and Pathfinder’s hypothesis that a PHE approach could be used to deconstruct established gender roles, increase income, save family time, and improve community cooperation. Each of these factors improve conservation and health outcomes.

Here’s an example from Sellers’ research on how PHE integration helped prompt a shift to sustainable livelihoods—especially important since a large percentage of Uganda and Kenya’s populations are youth of working age.

Following the first 2.5 years of the program (2011-2014), model household couples reported having more time because of the project’s interventions. That increased time came through three pathways: people needed to care for fewer children because of their ability to use family planning to space their pregnancies; were sick less often because of increased access to healthcare; and because they had to spend less time collecting firewood for energy efficient cookstoves. “This additional time was often devoted to livelihood activities such as beekeeping, tree planting, or gardening, all of which the project has provided training in [...] and most of which are likely to have positive or at least neutral conservation outcomes,” Sellers writes. In other words, more free time translated to reduced pressure on vulnerable natural resources like firewood and fisheries.[xxvi]

[xxvi] In your community, if people had more time, would this translate into better environmental outcomes? Why or why not? What would need to change for positive environmental outcomes?

↘ *Appendix 2: Linkages between project interventions and improved maternal health outcomes and natural resources management, from Samuel Sellers’ integration paper*

Another HoPE-LVB hypothesis was that the more sustainable use of natural resources would lead to people recognizing the benefits that come with a healthier lake or reforestation. The theory was that couples may reconsider their family size in order to reduce strain on the environment. While Sellers’ research found people were starting to understand this connection between birth rates and environmental sustainability, no family had specifically chosen to not have a child because of it.

A tree nursery that has been started on Zinga Island as part of the HoPE-LVB's reforestation efforts.

Interestingly, family planning concepts have changed the way fisherfolk look at their fishing activities. "When you don't illegally fish, it gives some time for the young fish to grow which means they'll be bigger and able to breed other fish later. It connects to family planning—we now plan for the lake," explains Lawrensio, the head of the Beach Management Unit.

The State of the Lake

Population pressures and illegal fishing are two of the many challenges being faced by Lake Victoria and, in turn, the people who depend on the lake for their livelihoods, water, and food.

Algal blooms (eutrophication) have also been a threat since they first appeared in 1986.[42] Scientists have connected the increase in algal blooms to the extinction of several haplochromine cichlid species due to the introduction of Nile perch.[43] These extinctions affected the food chain in Lake Victoria, reducing the fish species that historically moderated the amount of vegetation and animal decay in the lake. Algal blooms reduce oxygen in the water, killing fish species and compounding matters of overfishing. Lakeside population growth also plays a role: the more wastewater and other effluent that enters the lake, the more the nutrient content favors the growth of algal blooms.[44]

Prior to extinction, the haplochromine cichlid species also fed on *Biomphalaria* and *Bulinus*, two species of snails that serve as an intermediate host for schistosomiasis,[45] a parasitic disease that, in the Lake Victoria region, goes by the name of bilharzia.[xxvii] As schistosomiasis was not well documented prior to the introduction of Nile perch, the connection has not been confirmed but is plausible.

[xxvii] Another case study in this anthology looks at how land use management and dam construction in the Senegal River Basin in West Africa has affected the spread of schistosomiasis in the region.

Annet, the mother of seven, says she also uses concepts of family planning in her garden. A cluster of *matooke* trees grows around the back of her house. It is here that Annet says people are able to first grasp the concept of PHE. "The more *matooke* trees you have growing next to one another, the smaller the bunch of bananas they produce," she explains. "You need to thin your banana plantation to get a bigger bunch. This is the same with family planning—if you have a smaller family then they're often healthier because of it."

This community-level change demonstrated by Lawrensio and Annet is a key part of HoPE's local-level advocacy. A longer-term goal of HoPE-LVB was to make sure these changes remained once the project ended—and that they could be used to inspire new PHE projects across the region.

Epilogue: Institutionalizing a PHE Approach

In Kenya's capital city of Nairobi, the jacaranda trees are flowering, their distinctive purple blooms arching over the roadway. Pathfinder International's Kenyan office sits down a road like this. Inside the boardroom surrounded by PHE literature is Pamela Onduso, the organization's Youth, Advocacy, and Partnership Advisor in Kenya. An expert in reproductive health, family planning, and PHE programming, Onduso has worked with Pathfinder for over two decades.

Onduso supports Pathfinder's Kenya office in resource mobilization, sexual and reproductive health program implementation, and sustainability efforts. The latter includes dealing with the inevitability that accompanies any international development project, including HoPE-LVB: what happens when funding finishes and the project must end? Knowing such a future was on the horizon, the Pathfinder team designed HoPE-LVB with sustainability and scalability in mind. This meant finding ways to get policymakers at all levels to understand PHE and adopt its integrated development practices into policies and programs.

To that end, Pathfinder partnered with ExpandNet, a global network of public health professionals and scientists who develop strategies to scale public health solutions. ExpandNet has worked with the HoPE-LVB team from the beginning to plan, implement, and expand the PHE approach to benefit more people and support long-lasting policymaking.

That meant engaging target communities through public, private, and faith-based organizational partnerships to pilot diverse PHE integration models, monitor implementation, and plan for expansion based on successful, evidence-based interventions. In its first three years, the HoPE -LVB project succeeded in fostering a high degree of ownership among government stakeholders in both Kenya and Uganda. Community, district, national, and regional stakeholders were briefed about the project early on, told about the proposed model household interventions, and asked about their own pressing needs and obstacles.

This participatory exercise shaped the project in significant ways.[45] For example, it informed the decision to include district and county officials in environmental conservation activities. Doing so boosted project buy-in and the approval of new local by-laws. Building for scalability (anticipating to expand the project to new communities and add more model households) also helped HoPE-LVB grow to a larger geographic area during the second phase (2014-2017), though the approach was tweaked to meet different local contexts and settlement patterns.

Next came the creation of PHE steering committees in the two Ugandan districts and two Kenyan counties where HoPE-LVB operates. Committee members come from multi-sectoral ministries whose work links to PHE efforts. Pamela Onduso says those steering committees have been key to earning acceptance at county and district levels of governance, which bridges the gap between community decision-making and national policy. "Everyone can see the problem, but you can't begin to break it down and see how your different perspectives and resources can contribute to a solution until you have a common understanding and platform to bring you together," she says of the steering committees.

When it comes to engaging various levels of government, PHE adoption is a long-term process. Onduso explains that advocating for PHE and sexual and reproductive health requires tact and good communication skills.

Just as HoPE-LVB employed diverse strategies to effectively engage communities, there are also best practices when it comes to advocacy with the public sector and faith-based organizations. That means that while Pathfinder International frames HoPE-LVB as a "rights-based approach" to sexual and reproductive health, it also wants to avoid misinterpretation of what services fall under the category of family planning. As a result, increased access to contraception and the concept of healthy timing and spacing of pregnancy are promoted within the framing of helping communities improve their health and livelihoods, as well as conserve critical ecosystems. Knowing which messaging to use has been key in making PHE advocacy a success.

Strategic local, national, regional, and global partnerships have also helped. In 2015, HoPE-LVB signed a Memorandum of Understanding (MoU) with the Lake Victoria Basin Commission (LVBC), a specialized institution of the East African Community (EAC).[xxviii] One of the roles of the LVBC is to coordinate the design and implementation of an integrated PHE program across the Lake Victoria Basin, applying integrated solutions to interlinked health

[xxviii] EAC countries in the Lake Victoria Basin include Kenya, Uganda, Tanzania, Rwanda, Burundi .

and environment challenges. “We use evidence from HoPE-LVB to advocate to change policies in each of the relevant ministries, and now there is an EAC PHE Strategic Plan,” says Doreen Othero, the Regional Programme Coordinator for the Integrated PHE Programme at the LVBC. “Without that evidence we would not have convinced our ministers.”

Projects Precede Policy

Evidence from the HoPE-LVB project has also helped Andrew Tiondi, a bureaucrat with Uganda’s National Population Council, and Coordinator of the country’s National PHE Network. Like Onduso, Tiondi collaborates with government officials in various ministries and jurisdictions to adopt a multi-sectoral approach to solving some of the country’s development challenges. Raised in a fishing community in northern Uganda, Tiondi understands some of the environmental pressures villages face. Not all policymakers have the benefit of that firsthand experience, and concepts like family planning and improved latrines can go over the heads of bureaucrats sitting in a bustling capital city. That’s why field visits to model households are important.

Government officials understand once they see the model households in action, Tiondi says. “The PHE model households address important issues the government is grappling with: preventative health by having basic sanitation interventions in place, health and nutrition, and the fact that Uganda’s population is increasing but its land and resources are finite,” Tiondi says. Ultimately, there are mutual benefits to be gained from HoPE-LVB cooperating with the national government, and vice versa. For the government, the project’s community-level interventions help reach every household in a way national or district-level programs may struggle to do, particularly in rural and isolated fishing communities. From HoPE-LVB’s perspective, support from national government leaders is needed to work with district level staff in departments like community development, culture, and health.

Uganda and Kenya have recently finalized their national PHE strategies. Now, government PHE champions like Tiondi can work to weave PHE values into specific ministerial policies related to health, water, environment, and beyond. It may seem like a lot of paperwork, but these policy pieces are needed to institutionalize the value of integration and advocate for greater budget allocations for PHE projects. “Some officials are still cagey about the multi-sectoral approach, and questions arise about how we will pool resources,” Tiondi says. “But they’re not looking at the bigger picture. As a government you may not be able to deliver an outcome because you need other players to play a role in that delivery.”

As with any initiative, more funding is needed to support PHE integration across the Lake Victoria Basin. Pathfinder and its collaborators still struggle with single sector funding: “everyone always looks at which budget PHE activities should come from—Conservation? Health? Planning?” says Dorah Taranta, HoPE-LVB’s Uganda Project Manager. Meanwhile, Doreen Othero of the Lake Victoria Basin Commission remains hopeful that the PHE integration efforts started by HoPE-LVB can be continued, even without donor funding. “That has been my main worry, and I’ve told Pathfinder many times that they need to build capacity of the people who will be here beyond the project life cycle,” she says.

There are some positive signs of financial support in Uganda. The national government has pledged 4 billion Ugandan shillings (about US $1.5 million) to start PHE model households in the Mount Elgon region of Kenya and Uganda. The area bears similarities to the Lake Victoria Basin: large family sizes and environmental degradation, though in mountainside communities. “While several LVBC environmental programs have been implemented in this area before, it was realized that there was the need to pay attention to the link between environmental challenges in the basin and community health issues,” Othero says. “Previous challenges were addressed vertically: per sector, and in silos.”

Ultimately, Pathfinder International is confident HoPE-LVB has demonstrated that a PHE approach is needed—and possible—across multiple complex ecosystems, socioeconomic contexts, and geographies. “In the past, people thought PHE was a little boutique project,” says Sono Aibe, the Pathfinder International Senior Advisor who first led the way for the organization’s PHE efforts. “Thankfully, I think Pathfinder was able to fill that gap, demonstrating scalability, institutionalization, and the advocacy for new policies.”

Keeping Track of Who's Who

Sono Aibe

Former Senior Program Advisor at Pathfinder International, PHE specialist

Namudu Annet

Model household and mother, Bussi Island

Taddwa Lawrensio

Community health worker in Nabukavesi

Stellah Mbatudde

HoPE-LVB field staff in Uganda in charge of environmental conservation

Winnie Nkalubo

Fisheries biologist, NaFIRRI

Pamela Onduso

Youth, Advocacy, and Partnership Advisor, Pathfinder International Kenya

Andrew Tiondi

Coordinator of Uganda's National PHE Network

Namakula Edith

Village Health Team Member, Bussi Island

Dr. Kathyrn Fiorella

Assistant Professor, Department of Population Medicine and Diagnostic Sciences at Cornell University

Isiah Kisiki

Life-long resident of Bussi Island

Jackie Nakajubi

HoPE-LVB field staff in Uganda in charge of health and family planning

Herbert Nakiyend

Fisheries biologist, NaFIRRI

Namuyaba Margaret and Kayemba Taddeo

A couple and model household family on Bussi Island

Dr. Alex Opio

Epidemiologist and former director of Uganda's HIV/AIDS Control Program

Doreen Othero

Regional Programme Coordinator for the Integrated PHE Programme at the Lake Victoria Basin Commission

Dorah Taranta

Project Manager for the HoPE-LVB project in Uganda

Acknowledgements

Thank you to the Pathfinder International teams in the United States, Uganda, and Kenya—and an additional shout-out to Jackie and Stellah for helping with my visit to Bussi and Zinga islands. Dr. Katherine Fiorella and the staff at the National Fisheries Resources Research Institute in Jinja, Uganda, helped me better grasp the human health and natural resources nuances of this case. As with the entire anthology, this case study would not have been possible without the help and stories of those interviewed. Finally, thank you to Anisha Mohil and Nikita Smeshko for hosting me in Kampala.

A mother and her child on Zinga Island in the Ugandan portion of Lake Victoria.

Bibliography

[1] York, Suzanne and Engelman, Robert. "Connecting Family Planning, Rights and the Environment for Planetary Health." Communicating Planetary Health. January 8, 2019; https://medium.com/communicating-planetary-health/connecting-family-planning-rights-and-the-environment-for-planetary-health-9852b4d2ec5f

[2] http://documents.worldbank.org/curated/en/537691468202150422/pdf/PID-Appraisal-Print-P153466-03-23-2015-1427143505609.pdf The East Africa Community is made up of six countries: Tanzania, Kenya, Uganda, Burundi, Rwanda, and South Sudan.

[3] Ogutu-Ohwayo, Richard. "Management of the Nile perch, Lates niloticus fishery in Lake Victoria in light of the changes in its life history characteristics." African Journal of Ecology 42:4. January 7, 2005; https://doi.org/10.1111/j.1365-2028.2004.00527.x

[4] Pringle, Robert M.

[5] Pringle, Robert M. "The Origins of the Nile Perch in Lake Victoria." BioScience 55:9. September 1, 2005; https://doi.org/10.1641/0006-3568(2005)055[0780:TOOTNP]2.0.CO;2

[6] Pringle, Robert M. "The Nile Perch in Lake Victoria: Local Responses and Adaptations." Africa. November 2005; https://www.researchgate.net/publication/250227017

[7] Pringle, Robert M.

[8] Downing, Andrea S., et al. "Was Lates Late? A Null Model for the Nile Perch Boom in Lake Victoria." PLOS ONE. October 18, 2013; https://doi.org/10.1371/journal.pone.0076847

[9] Reynolds, J. Eric, et al. "Thirty years on: the development of the Nile perch fishery in Lake Victoria." The Impact of Species Changes in African Lakes. 1995; https://doi.org/10.1007/978-94-011-0563-7_10

[10] "Lake Victoria." International Union for the Conservation of Nature (IUCN). 2018; https://www.iucn.org/theme/species/our-work/freshwater-biodiversity/what-we-do/lake-victoria

[11] Njiru, M., et al. "An overview of the current status of Lake Victoria fishery: Opportunities, challenges and management strategies." Lakes & Reservoirs Research & Management 13:1. January 22, 2008; https://doi.org/10.1111/j.1440-1770.2007.00358.x

[12] Njiru, M., et al.

[13] Turyaheebwa, Nicholas. "Perception on fishery trends in Lake Victoria." Norwegian College of Fishery Science. https://munin.uit.no/bitstream/handle/10037/7140/thesis.pdf?sequence=2

[14] LVFO Secretariat. "Fisheries Management Plan III (FMP III) for Lake Victoria Fisheries 2016 - 2010." East African Community. http://www.lvfo.org/sites/default/files/Final%20FMP%20III%202016%20to%202020_0.pdf

[15] Njiru, M., et al.

[16] LVFO Secretariat. "Fisheries Management Plan III for Lake Victoria Fisheries 2016-2020." East African Community; http://www.lvfo.org/sites/default/files/Final%20FMP%20III%202016%20to%202020_0.pdf

[17] Opio, Alex, et al. "HIV Infection in Fishing Communities of Lake Victoria Basin of Uganda – A Cross-Sectional Sero-Behavioral Survey." PLOS ONE. August 5, 2013; https://doi.org/10.1371/journal.pone.0070770

[18] Yebra, Gonzalo, et al. "Analysis of the history and spread of HIV-1 in Uganda using phylodynamics." Journal of General Virology. July 2015; https://dx.doi.org/10.1099%2Fvir.0.000107

[19] Opio, Alex, et al.

[20] Fiorella, Kathryn J., et al. "Human health alters the sustainability of fishing practices in East Africa." PNAS. April 4, 2017; https://doi.org/10.1073/pnas.1613260114

[21] Fiorella, Kathryn J., et al. "Transactional Fish-for-Sex Relationships Amid Declining Fish Access in Kenya." World Development. October 2015; https://doi.org/10.1016/j.worlddev.2015.05.015

[22] "Lake Victoria Falling Water Levels Concern for Growing Population." United Nations Environmental Programme Division of Early Warning & Assessment. https://na.unep.net/atlas/africaLakes/downloads/posters/Lake_Victoria.pdf

[23] World Bank

[24] "The Issues." Global Alliance for Clean Cookstoves. http://carbonfinanceforcookstoves.org/about-cookstoves/introduction/

[25] Aibe, Sono, et al. "Health of People and the Environment Lake Victoria Basin Project Baseline Study Synthesis Report." Pathfinder International. 2013; https://www.pathfinder.org/wp-content/uploads/2016/09/Health-of-People-and-the-Environment-Lake-Victoria-Basin-Project-Baseline-Study-Synthesis-Report-1.pdf

[26] Aibe, Sono. "Scaling-up the Population, Health, and Environment Approach in the Lake Victoria Basin: A Review of the Results from Phases I and II of the HoPE-LVB Project." Pathfinder International. September 2018; https://www.researchgate.net/publication/327780767_Scaling-up_the_Population_Health_and_Environment_Approach_in_the_Lake-Victoria_Basin_A_Review_of_the_Results_from_Phases_I_and_II_of_the_HoPE-LVB_project

[27] Lopez-Carr, David, et al. "Health of the People and Environment in the Lake Victoria Basin (HoPE-LVB) Project Evaluation." USAID, p. x; http://ghpro.dexisonline.com/sites/default/files/350%20HoPE-LVB%20Report%20Final_with%20annexes_4-25-18.pdf

[28] Mbenywe, Mactilda. "Church to establish anti-contraceptive movement." Standard Digital. December 27, 2017; https://www.standardmedia.co.ke/article/2001264213/church-to-establish-anti-contraceptive-movement

[29] Lipka, Michael. "Africans among the most morally opposed to contraception." Pew Research Center. April 16, 2014. https://www.pewresearch.org/fact-tank/2014/04/16/africans-among-the-most-morally-opposed-to-contraception/

[30] Sundararajan, Radhika, et al. "How gender and religion impact uptake of family planning: results from a qualitative study in Northwestern Tanzania." BMC Women's Health. July 22, 2019; https://doi.org/10.1186/s12905-019-0802-6

[31] Aibe, Sono, et al.

[32] "Couple Year of Protection." John Hopkins Bloomberg School of Public Health. https://www.k4health.org/sites/default/files/Couple%20Year%20Protection.pdf

[33] "Health of People and Environment in the Lake Victoria Basin." Pathfinder International. 2018; https://www.pathfinder.org/projects/hope-lvb/

[34] Kavanaugh, Megan L., et al. "Contraception and Beyond: The Health Benefits of
Services Provided at Family Planning Centers." Guttmacher Institute. July 2013; https://www.guttmacher.org/sites/default/files/report_pdf/health-benefits.pdf

[35] Aibe, Sono. 2018.

[36] "Sustaining Health, Rights, and the Environment in the Lake Victoria Basin." Pathfinder International. June 2015; https://www.pathfinder.org/wp-content/uploads/2016/09/Sustaining_Rights_2015PHE.pdf

[37] Aibe, Sono. 2018.

[38] Aibe, Sono. 2018.

[39] Lopex-Carr, David, et al.

[40] Sundaram, Preethi. "Sexual and reproductive health and rights – the key to gender equality and women's empowerment." International Planned Parenthood Federation. February 2015; https://www.ippf.org/sites/default/files/2020_gender_equality_report_web.pdf

[41] Sellers, Samuel. "Does Doing More Result in Doing Better? Exploring Synergies in an Integrated Population, Health and Environment Project in East Africa." Environmental Conservation. September 14, 2018; https://doi.org/10.1017/S037689291800022X

[42] Ochumba, Peter B.O., et al. "Observations on blue-green algal blooms in the open waters of Lake Victoria, Kenya." African Journal of Ecology. March 1989; https://doi.org/10.1111/j.1365-2028.1989.tb00925.x

[43] Goldschmidt, Tijs, et a. "Cascading Effects of the Introduced Nile Perch on the Detritivorous/Phytoplanktivorous Species in the Sublittoral Areas of Lake Victoria." Conservation Biology. September 1993; https://doi.org/10.1046/j.1523-1739.1993.07030686.x

[44] Anderson, Donald M., et al. "Harmful Algal Blooms and Eutrophication: Nutrient Sources, Composition, and Consequences." Estuaries. August 2002; https://www.whoi.edu/cms/files/Anderson_etal_2002_Estuaries_29903.pdf

[45] Slootweg, R. "Prey Selection by Molluscivorous Cichlids Foraging on a Schistosomiasis Vector Snail, Biomphalaria glabrata." Oecologia 74:2. 1987; https://www.jstor.org/stable/4218454

[46] Omimo, Antony, et al. "Applying ExpandNet's Systematic Approach to Scaling Up in an Integrated Population, Health and Environment Project in East Africa." Social Sciences 7:1. January 2, 2018; https://www.mdpi.com/2076-0760/7/1/8/htm

Resources from Learning Notes

Pathfinder International. Accessed April 30, 2020. https://www.pathfinder.org/#.

"A Timeline of HIV/AIDS." AIDS.gov. Accessed April 30, 2020. https://www.hiv.gov/sites/default/files/aidsgov-timeline.pdf

Roser, Max and Hannah Ritchie. "HIV and AIDS." Our World in Data. Last modified November 2019. https://ourworldindata.org/hiv-aids

Hartmann, Betsy. Reproductive Rights and Wrongs: The Global Politics of Population Control. Boston, MA: South End Press, 1995.

Acronyms

AIDS – Acquired immunodeficiency syndrome
BMU – Beach Management Unit
CYP – Couple Years of Protection
EAC – East African Community
FP – family planning
HIV – Human immunodeficiency virus
HoPE-LVB – Health of People and Environment in the Lake Victoria Basin
IUCD – intrauterine contraceptive devices
LVB – Lake Victoria Basin
LVBC – Lake Victoria Basin Commission
MoU – Memorandum of Understanding
NaFIRRI – National Fisheries Resources Research Institute
NGO – non-governmental organization
RH – reproductive health
PHE – population, health, environment
SRH – sexual and reproductive health
VHT – Village Health Team
WASH – water, sanitation, and hygiene.

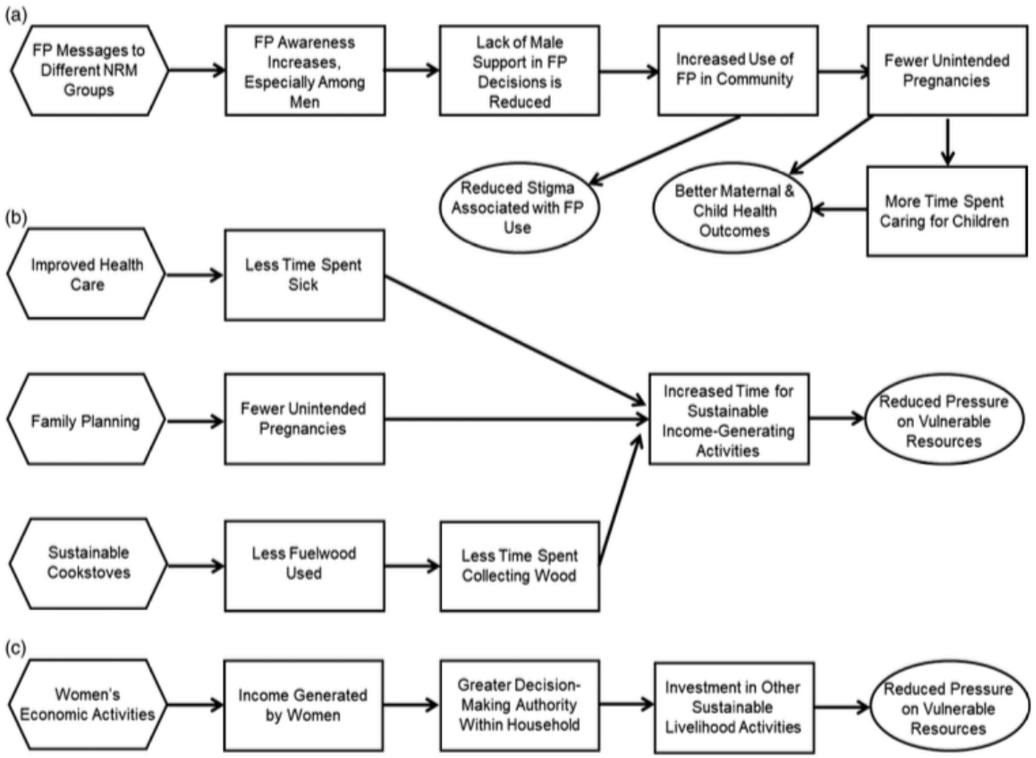


Fig. 1. Results chains depicting linkages successfully described with midterm review data. Hexagons represent a component of the project's intervention, rectangles depict short-term outcomes and ovals illustrate longer-term effects resulting from these outcomes. (*a*) Results chain displaying linkage between providing FP messages to NRM groups and improved maternal health outcomes. (*b*) Results chain displaying linkage between time-saving activities and reduced pressure on vulnerable resources. (*c*) Results chain displaying linkage between women's income-generating activities and household-level NRM choices. FP = family planning; NRM = natural resource management.

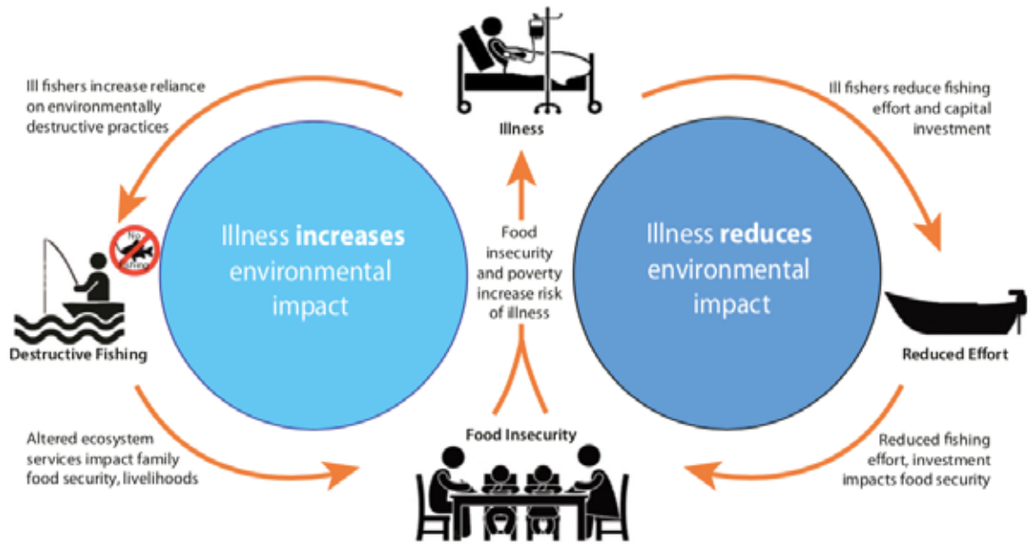


Fig. 1. (*Right*) Traditional and (*Left*) alternative pathways linking human and environmental health in fishing communities. In the face of illness, households may alter their pressure on environmental resources to increase their reliance on destructive practices or curtail their harvest effort. These feedbacks portend sharply different environmental consequences of human illness, even as outcomes for households remain similar.