Impact Assessment for the Livelihood of Fishfarmers

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Caribbean Harvest

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LEVE
Local Enterprise and Value Chain Enhancement Project

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by

Socio-Dig

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ACRONYMS

Local Enterprise and Value Chain Enhancement (LEVE)

Micro, small and medium enterprises (MSMEs)

Caribbean Harvest (CH)

Caribbean Harvest Foundation and Caribbean Harvest social enterprise (CH)

Food for the Poor (FFP)

United States Aid to International Development (USAID)

Ministère de l'Agriculture, des Ressources Naturelles et du Développement Rural (MARNDR)

A. Preface:
Objective of the Study and Participating Organizations

Objective of the Study

This document describes an evidence-based evaluation of the immediate and long-term impact of LEVE/USAID grants to the fishfarming entities Caribbean Harvest Foundation and Caribbean Harvest Social Enterprise, both hereon referred to jointly as CH. Specifically, quoting from the RFP,

> The purpose of this short-term consultancy is to evaluate the immediate and longer-term impact of LEVE's intervention with CH on the livelihoods of the 50 fish farmers who received cages, and their families. LEVE and CH are ultimately interested to know what impact, if any, this intervention has had upon the resiliency of the fish farmer, and their ability to sustainably continue this economic activity to the benefit of their family, their community and ultimately the Haitian economy.

LEVE

The USAID-funded Local Enterprise and Value Chain Enhancement (LEVE) project strives to increase economic growth and employment opportunities in Haiti. LEVE is expanding opportunities for micro, small and medium enterprises (MSMEs) to generate employment for Haitian men, women, and youth in the three development corridors: Port-au-Prince, Saint-Marc and Cap-Haïtien. LEVE is improving the competitiveness of key sectors: construction, apparel and textile, and agribusiness, working with select value chains with the most potential for growth. (quoted from LEVE Request for Proposals, "Impact Assessment of the Livelihoods of Fishfarmers").

Caribbean Harvest

Caribbean Harvest is a Haitian Charitable Foundation whose exclusive mission is to serve the needy people living in the impoverished villages that surround Haiti's largest lakes. First, one of the Caribbean's most modern fish hatcheries was established in Croix-des-Bouquets, a farming community near Port-au-Prince. Next, a prototype fish farm operation was set up near the Dominican Republic in Lake Azuei, Haiti's largest lake. (quoted from Caribbean Harvest Website, see also Appendix 1). Caribbean Harvest also has a fish hatchery in *Boukan Kare,* on Haiti's Plateau Central, where it supplies fishfarmers on Lake Peligre.

Socio-Dig

Socio-Dig is a Haitian, female-owned social enterprise led by internationally trained PhDs and MAs in Anthropology, GIS, Agronomy, and Statistics. Socio-Dig's expertise is sampling design, survey implementation and analysis. The organization specializes in a wide assortment of survey techniques and strategies from simple random baseline surveys in health and agriculture to rapid rural appraisals (see Sociodig.com).

B. Executive Summary

This document describes an evidence-based evaluation of the immediate and long-term impact of LEVE/USAID grants to the fishfarming entities Caribbean Harvest Foundation and Caribbean Harvest Social Enterprise, both hereon referred to jointly as CH. Specifically, the study was interested in evaluating the impact on the resiliency of participating households.

After two months of intensive review of all the available literature, internet searches, hundreds of interviews, 10 focus groups, censuses of five villages, a nutritional survey of children, and in-depth follow-up surveys, our conclusion is that CH and its partners have had little to no impact on the resiliency of any more than a few beneficiaries. Specifically, there are only four impoverished lakeside fisherfolk who are currently project participants. Indeed, the CH activities are so insignificant that the Socio-Dig team could not identify a sample large enough to evaluate impact on beneficiary resiliency. Thus, most of the efforts of the research were focused on documenting and explaining the radical disjunction between CH and partners claims to have, for example, increased income levels by 1,000 percent for hundreds (if not thousands) of beneficiaries, and the reality of the program.

In 2014, LEVE gave a $250,000 grant to the CH project to increase its Croix-des-Bouquets hatchery solar energy capacity from 70 kw to 133 kw and to finance the construction of 257 cages for fishfarmers. In 2017 LEVE gave another $50,000 to CH to underwrite the establishment of a network of fish sales points. The Socio-Dig research team was tasked with evaluating the impact of these investments, specifically with respect to impact on the resiliency (capacity to resist shocks) of CH fishfarming beneficiaries in comparison to non-fishfarming families. While the study did find significantly better nutritional status among children in the community where CH currently shares cages with fishfarmers and supports social programs, there is little to no evidence that this has anything to do with CH activities.

The way the CH model is supposed to work is that each fish-farmer receives a kit, which contains two 4 m^3 fish cages, 1,200 fingerlings (small fish), and enough feed to raise the fish to harvestable size, a process that takes 4 months. The beneficiaries are responsible for feeding the fish three times daily. At harvest, CH gives 10 percent of the fish to the families for consumption and then sells the remaining 90 percent of fish. From the proceeds, CH deducts the cost of feed and other inputs, and then shares the profits with the beneficiary family that care for the fish. The beneficiary household receives 40 percent of the profits, CH takes 40 percent of the profits as business income and for reinvestment in the CH social enterprise, and then uses the remaining 20 percent of profits to finance social programs in the communities where the fishfarmers live. These social programs include educational subsidies, provision of water, healthcare, and improved housing.

CH claims that this model yields 800 to 1,200 lbs. of fish per 4-meter^3 over a period of four months, that each cage provides two or more harvests per year, and that the resulting revenues raise the fishfarmers income from an average of $300 per year to $1,000 and even $3,000. The number of beneficiaries reportedly reached 100s by 2009 and has been growing ever since, as the program is "self-sustaining".

After interviewing 313 household heads in all of the target communities, the assessment team found only 43 households that reported ever having participated in the program. In addition, instead of increasing beneficiary income from the rural average of $300 per year per household to as much as $3,000 per year, the survey responses indicated an average income per harvest of $44. About half of the beneficiaries reported having only ever participate in a single harvest. Another 25 percent reported having only ever participated in two harvests. Two reported having ever participated in three or more harvests (specifically, 33 respondents reported only ever harvesting a cage once, either reported having participated in two harvests and two reported harvesting three or more times).

We found similar evidence of program shortfalls drawing on data obtained from the CH agronomist who recorded harvests on Lake Azuei for the 23 months August 2015 to June 2017. There was a total of 59 unique beneficiaries on the lists. Almost identical to the survey findings, average income per harvest for the beneficiaries was $43. Half the beneficiaries had only participated in a single harvest. The maximum number of harvests recorded in CH records was 11, achieved by a single beneficiary over a 23-month period. The number of beneficiaries participating at the time of the evaluation was four who together owned a total of five cages.

Both the CH fishfarming program and the CH social programs are so insignificant that there was essentially nothing to evaluate except the dramatic shortcomings of the program vis a vis the enormous sums of donor money spent and the spectacular claims made over the course of the past 12 years.

As part of the assessment on resiliency, the Socio-Dig research team also examined the impact of the social programs. The findings show that CH has essentially no significant social activities in any other community except Betel, and even the Betel programs are far less significant than claimed. The CH social programs are especially trivial when compared to vigorous assistance programs of Hotes Foundation, Operation Blessing, Love-a-Child, Food for the Poor and some half a dozen other humanitarian aid organizations operating in the area. Indeed, of all the communities studied, Betel, the community where CH is most active and has essentially a monopoly on assistance programs is arguably, despite having model cement houses, the most deprived. Most residents of Betel send their children to school and participate in assistance programs in neighboring communities. Most the people thought to live in Betel in fact live in the neighboring community of Kanez-Belizè from where they were ostensibly relocated.

The two social programs that CH can legitimately claim are a school and a health program. The school is held in a church and abandoned Betel houses and goes up to the 2nd grade (primary school 2nd grade) while the health program consists of bi-annual 1-week visits from a team of faculty and students from the School of Pharmacy at the University of Florida. Both the school and the health care program are, as with other programs, insignificant compared to the programs of other aid agencies in the area and may even be a hinderance to these other programs.

The assessment team findings show that the children in Betel are in a superior state of nutritional health as compared to children evaluated in other communities. However, overwhelming evidence suggests this has nothing to do with CH activities. CH 's child feeding program in the K to 2nd grade school started in 2017-2018 (the first year of operation of the school), but at the time of the assessment (September thru to the end of October), there had been no feeding activity since the opening of the school year. In contrast, the neighboring Kanez-Belizè village has an air-conditioned pre-school supported by the Hotes Foundation and a K to 8th grade elementary school established and funded by Operation Blessing International. Both schools have weekly health clinics and both schools feed the children twice per school day. The Hotes foundation also has a six-room , airconditioned clinic staffed with a nurse and open five days per week, eight hours per day. Hotes also provides all households with all potable water needs and has installed three functioning wells that pump clean brackish water for the use of 20 community flush toilets and showers. For the past four years the Hotes Foundation has also operated a community feeding program that daily feeds all women and children one hot-meal (including meat) five times per week. In contrast, and contrary to claims by CH, Betel has none of the preceding. The assessment team found that most of the residents of Betel were "dual" residents of Betel and Kanez-Belizè, as they move freely from one village to the other, thus benefitting from the Hotes Foundations community development, health and nutrition programs.

Figure B1: Map Location of Lakes

C. Background: History of Aquaculture in Haiti and Reason for the Study

Aquaculture in Haiti

Aquaculture began in Haiti as early as 1951 with a collaborative FAO/MARNDR five-year fish-farming project that imported Common Carp from Alabama USA and Tilapia Mossambica from Jamaica. The fish were used to stock rivers, lakes and irrigation canals. In 1954, 17,000 Carp fingerlings and 50,000 Tilapia fingerlings were released in Lake Azuei. Restocking occurred annually until 1967. In the 10 years 1958 to 1968, 4,824 fish ponds, each of an area of ~100 m^2, were built in various regions of Haiti—mostly on the Artibonite--and stocked with 798,669 Carp fingerlings and 815,765 Tilapia Mossambica. Some efforts at fish cultivation in cages were made by FAO in 1989-90, but for the most part cultivation of fish in Haiti languished in the 1970s and all but disappeared until Auburn University graduate Dr. Valentin Abe led a revival in 2006.[i]

History of Caribbean Harvest

According to the Caribbean Harvest website (CaribbeanHarvest.org), Dr. Abe founded the Caribbean Harvest Foundation (CH) in 2005 and began breeding imported Red and Israeli Tilapia at a hatchery in Croix de Bouquets. In 2007, CH was experimenting with one-meter cages for raising fish on Lake Azuei. By 2009, Dr. Abe and supporters claim that CH had adapted the system to local conditions and that they had distributed 70 four-meter cages to lakeside fishfarmers.

In 2009, CH partnered with Operation Blessing International to ramp up the program and increase beneficiaries. Specifically, Operation Blessing funded cages, provided a generator, vehicle, laboratory, and underwrote operational costs. By 2011 the partnership had soured. Operation Blessing leadership was disappointed with CH management and with the low production of fingerlings and so financed the creation of their own fish hatchery. However, in that same year (2009), impressed with CH claims of high production and purported increase in beneficiary income by a factor as high as 10 times what they had been earning, Bill Clinton lauded the CH model as, "the biggest return on an investment under $1 million for people to chart their own course in life that I have yet seen. It's stunning. It's amazing."[ii] The Clinton Foundation also pledged $2.1 million in support. And in 2010, with Bill Clinton writing the headnote, Dr. Abe was named a TIME Magazine 100 most influential people. [iii]

In the 8 years since that time CH has benefitted from significant donations intended to support investment in fish cages and infrastructure, including $250,000 from the Clinton Bush Foundation, $1.5 million from the World We Want Foundation, $2 million from Social Enterprise Fund, and $300,000 from USAID/LEVE. Other donations, the amounts of which are not known, came from FAO, World Vision, Food for the Poor, Oxfam, Heifer International, IDB, MANDR, NRG, SELF, UN Office of the Special Envoy, Partners in Health, and an unknown number of individuals who learned of CH success from continued praise from Bill Clinton, from the Time Magazine exposure, as well as claims from the cited donors, all of whom accepted CH claims at face value

and hence repeated them on their websites and in communiques and videos intended for their own donors.

Village of Betel

Of special importance to this evaluation is the village of Betel. Betel is special to the study because of all five communities, only Betel is currently part of the aquaculture program. Moreover, CH played a pivotal role in the founding of the village. In 2012, CH entered into a partnership with Food for the Poor (FFP). CH purchased land and FFP built 104 houses on the property. CH then relocated 100 families from the nearby villages of Kanez and Madam Belizè (referred to in most of this report as the single village of Kanez-Belizè because of their close proximity). These 100 families were intended to comprise the core of CH fishfarming beneficiaries.

Figure C1: The Model Village of Betel

LEVE/USAID Contribution

In 2015, LEVE co-financed a three-pronged scheme to boost CH enterprise by, 1) increasing the capacity of solar equipment at the CH hatchery, 2) subsidizing the purchase of cages for beneficiaries, and 3) assisting in the creation of a fish marketing distribution network. Specifically, LEVE donated $250,000 for the increase in CH solar power from 73 kw to 133 kw and to increase a small cage capacity by 300 (257 were reportedly built), the profits of which were to be shared with beneficiaries who care for and feed the fish. Overall the investment was intended to contribute to a doubling of CH fish production. The increased energy capacity would, according to CH, increase fingerling production from 2.5 million to 5 million per year. The increase in cages was expected to double the number of fishfarmers. In 2017 LEVE gave CH another $50,000 meant to establish fish sales points, ostensibly to provide an outlet for the increased production. [iv]

Reason for the Study

The purpose of this study was to evaluate the immediate and longer-term impact of LEVE's intervention with CH on the livelihoods of fishfarmers who received cages, particularly in terms of resiliency (discussed below). LEVE was interested to know what impact, if any, this intervention has had upon the resiliency of the fishfarmers, their families, their communities and, ultimately, the Haitian economy. LEVE was also interested in confirming how CH works with beneficiaries to create profits, how it shares those profits with the beneficiaries, and how it then funnels 20 percent of profits to social programs in the communities where the beneficiaries live, all of which, it was assumed, contributed to the resiliency of beneficiaries.

D. Research Methodology

Research Strategy

The study was intended to evaluate the impact of LEVE's contribution to increased production of fish. The focus was intended to be on, a) the impact of increased production of fingerlings, through the increased solar capacity at the hatchery, which would increase capacity to aerate the fish, something that was expected to double fingerling production and b) increased production on the lake through provision of small cages to beneficiaries, which were to double in number. More broadly, the research was designed to determine to what extent aquaculture has contributed to the absorptive, adaptative and transformative resiliency of those individuals and their families who practice fishfarming in association with CH. Using households as units of analysis, Socio-Dig research team intended to compare **resiliency** of fishfarmer families vs. counterparts not engaged in LEVE supported fishfarming and determine what caused or did not cause differential resiliency of people in the studied communities.

Definition and Concept of Resiliency

The concepts and measurements drew on USAID commissioned research that defines resiliency as the ability of a household to resist shocks brought about by economic crises (e.g. recession and inflation), environmental crises (e.g. storm, floods, and earthquakes), political crises (e.g. embargo, strikes and riots) or intra-household crisis (e.g. loss of income or property by theft, death of livestock from epidemic or accident, and illness or death of a family member). Even more specifically, USAID (2017a, 2017b), breaks resiliency into three conceptual categories,

- Absorptive resiliency: determine if CH fishfarming households are better prepared than in the past to deal with internal and external household shocks and are they better prepared than households that are not participating in CH supported aquaculture.
- Adaptative resiliency: determine if CH fishfarming households make more aggressive and enlightened investments in alternative livelihood strategies than those households not directly involved in the CH fishfarm program.
- Transformative resiliency: determine if CH aquaculture activities contribute in any way to local governance and community social protection strategies. [v]

Period of Research and Number of Team Members

The research took place from September 8th to October 30th of 2018. The research team was composed of 1) the team leader, a PhD in anthropology, fluent in Kreyol, English and Spanish, with 30 years of research experience in Haiti. 2) a four-person interview team composed of two women and two men, all Haitian nationals with three or more years of experience working on surveys with Socio-Dig. 3) A homebased logistic coordinator and telephone surveyor who is a Haitian national fluent in Kreyol, English, French, and Spanish. The team leader traveled by four-wheel drive vehicle. The four-person interview team traveled on two motorcycles.

Data Gathering Techniques

The research was designed to draw on village censuses, surveys, focus groups, and nutritional surveys of children. The evaluation was intended to be diachronic (how resiliency has changed over time), and synchronic (how resiliency for households and communities involved in the program currently compare to those families and communities not directly involved in aquaculture).

Nutritional Test

A specific test of resiliency was intended to be a comparison of nutritional status of children involved in the fishfarming program as well as those in the CH activity zone, i.e. the village of Betel, and the nearby villages where CH reported having social programs but since 2014 has had little to no fish-cage beneficiaries. The null hypothesis was that CH activities had no impact, i.e. that there would be no difference in the nutritional status of children in fishfarming families or in the Betel community vis a vis other children. If CH activities did have an impact, then a) the children living in households that participate in the project would display better nutritional status than children who are not participating in the fishfarming project, and b) the children in the community of Betel would display higher levels of nutritional status than other communities.

Research Accomplished

- Extensive review of the literature, internet searches
- Review of all reports provided by CH, (annual reports for 2013, 2014, 2014-15, and 2016-17) as well as documentation of all Lake Azuei harvests for the months August 2015 to June 2017
- 10 focus groups with members of both treatment communities (five focus groups) and control communities (five focus groups) involved a total of 89 people representing 73 households
- Interviewed 313 households in five communities
- Measured weight, height and brachial circumference for 89 children in four communities. Specifically, 28 in Betel and 61 in four other Lake Azuei communities
- 32 follow-up surveys with people who have/or have had cages (specifically, the Socio-Dig reached by telephone 32 of the 43 respondents who reported ever having had a cage, and asked questions about number of harvests, and income from harvest)
- 100 or more key informant interviews, including fishing association members on Lake Peligre and Lake Azuei
- Extensive field observation and photo analysis
- Examination of 6 different fishfarming operations and models
- Multiple visits to CH hatcheries at Lake Azuei (Croix-des-Bouquets) and Lake Peligre (Boukan Kare)
- Visits to CH cages on both Lake Azuei and Lake Peligre
- Ten respondent follow-up telephone verification regarding water availability in the community of Betel

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Figure D1 & D2: Socio-Dig Team at work measuring children in Betel

Figure D3 & D4: Socio-Dig surveyors record measurements but are also required to take a picture of each child, a picture of the measurement, and a picture of vaccination card, if available

Figure D5 & D6: Infant being weighed in the swing scale

Figure D7 & D8: Vaccination card and brachial measure

E. The Four Communities[1]

Since its inception in 2007, CH has worked on Lake Azuei and Lake Peligre. Most of the activity (drawing on CH reports, about 66 percent) occurs on Lake Azuei where this study was focused. Over the course of the past 12 years, CH worked in four Lake Azuei villages. Since 2014, CH reported having scaled back its fishfarming to the single community of Betel, while maintaining social programs in all four communities (as per conference call with LEVE, CH and Socio-Dig on July 18, 2018, prior to the onset of the research). In studying the impact of CH activities, the research used Betel as a treatment group and the other three lakeside communities as control groups. Here are brief histories and descriptions of those Lake Azuei communities.

1) Betel is the treatment community. Built in 2012-2014 in association with Food for the Poor, prior to 2012, there was nothing at the current site of the village (see Figure E11 & E12 pages 11 to 12). The villagers were relocated from nearby Kanez-Belizè communities. Most did not stay and at the time of the assessment we found that of 60 percent of residents were renters or had borrowed the house (see Chart E1, page 13). Although there were half-hearted attempts to conceal the fact, it was concluded that many of those present are dual residents of Betel and Kanez-Belizè. Not only would respondents often admit this in conversations, but we often encountered and even interviewed the same people in both villages. The village of Betel only has one primary school that goes from kindergarten to the 2nd grade, created and sponsored by CH. There is a pump and desalinizer. CH also pays for the delivery of 1,000 gallons of supplemental fresh water every two weeks. A CH "healthcare program" consists of University of Florida Pharmacy faculty and students who visit for one week twice per year.
2) Kanez-Belizè is the twin-communities from where Betel households were relocated, in 2013-2014. In 2004, only Belizè was occupied and there was nothing more than two yards with a total of some 8 to 10 households. The area served as type of encampment for farmers who would come from the western end of the lake to fish. However, from 2004 to 2010, the lake rose significantly (see Figure E2 on page 9), engulfing 7 square miles of land, some of it fertile, impelling the former temporary residents to spend more time in Kanez-Belizè. By 2010 both villages had become significantly larger. Despite CH claiming to have relocated them, there is little evidence that the communities have changed in size since that time. CH staff is fully aware that the most people moved back to Kanez-Belizè or left the area altogether (see Figures E7-E10 on pages 10 to 12). Kanez-Belizè has a K to 8th grade primary school funded by Operation Blessing and a wide variety of programs funded and operated by the Hotes Foundation. The latter has installed an airconditioned clinic staffed with Haitian nurse and that has a maternity program, an airconditioned preschool, a modern kitchen that prepares full meals (with meat) for all women and children in the community five days a week, a community park, three brackish wells with pumps, ~20 showers and toilets, a 1-acre tree nursery and vegetable garden with rain water irrigation ponds. Hotes employs 20 villagers in fulltime jobs

[1] There were five communities, but as mentioned elsewhere in the text, because of their close proximity, two communities are collapsed under the name Kanez-Belizè

that are rotated among the locals to circulate revenue to all households in the community (see Figures F89 thru F98 on page 52).

3) Lilet is another community that existed prior to NGO intervention. In the 2002 Google Earth aerial photographs, the earliest time for which Google Earth provides historic imagery, homes are clearly visible (see Figure E5 & E6 page 10). However, while extensive historical data was not gathered for Lilet, it too was almost certainly a village that evolved from temporary lakeside fishing dwellings, in this case for people in the Fond Parisien area. Lilet is a natural port, as it is located on leeward side of a montane peninsula that juts out into the lake, thereby sheltering the area from the typically NE winds that rip across the lake daily from ~9 am until late afternoon. The Lilet port has grown in importance with the increasing importation of charcoal from the Dominican Republican. Significant quantities of charcoal cross over from the Haitian community, *Lotbo Etang*, located on the Dominican side of the lake, and are offloaded in Lilet. Although Lilet is, like Kanez-Belizè, a naturally occurring community, international organizations built 53 houses in the community for Haitian nationals who were refugees from the 2004 Jimani flood in the Dominican Republic. By 2010 those houses had been completely inundated by the rising lake waters and were abandoned. What happened to the residents is not clear, but the village itself has reconstituted some 100 yards inland of the lake and appears much as it did both prior to 2002 both terms of size and types of dwellings. Similar to Kanez-Belizè, Lilet is the site of a number of videos made by aid agencies, including several made by and on behalf of CH. Other organizations operating in Lilet include (but are not limited to) Oxfam, Food for the Poor, and OCMA, the latter a Haitian organization that as recently as August 22nd, 2018 held a mobile clinic in Lilet. However, Lilet's most important benefactor is Love-a-Child, a massive US Christian mission that built and sponsored Lilet primary school (K to 4th grade), a mobile clinic, and gives monthly food stipends to residents (see Figures E5 & E6 on page 10). With no obstacle standing in the way, Love-a-Child and its clinic, orphanage, and secondary school is located a 1.8 mile walk through the brush from Lilet. Lilet has one brackish well with hand pump.

4) Fon Bayard is similar to Betel in that it was entirely the creation of foreign aid efforts. The 100 houses that make-up the village were built following the 2004 Jimani flood and intended to house Haitian survivors from the Dominican side of the border (see Figure E3 & E4, pages 10). The community has a special identify as the last Haitian community before reaching the major Dominican-Haitian border post of Malpasse/Jimani, the post closest to Port-au-Prince and hence the busiest border crossing on the island. This position and a history of being the dropping off point and way station for Haitians deported from the DR has made Fon Bayard a magnet for aid agencies. Benefactors include the largest NGO on the planet, Food for the Poor, and Love-a-Child. The latter provides monthly food distributions and support to the K-6 primary school. Fon Bayard is located 4 miles from Love-a-Child—a trip that can be made by boat, foot, or conveniently on moto taxi 75 HTG on moto, it is only a 1 mile walk from the thriving primary care clinic, L'eau de Vie, supported by International Faith Missions, Love-a-

Child and World Vision. Bayard has a well but it was broken at the time of the survey, necessitating residents to pay 20 HTG to take public transport to Fond Parisien for water.

Discussion of the Communities: Influence of Humanitarian Aid

Several factors stand out regarding the studied communities. First off, three of them-- Kanez-Belizè, Lilet and Betel, are within walking distance of one another and with no other communities in between. All four communities are lakeside and inhabited with extremely impoverished people. Kanez-Belizè and Betel are the most remote of the communities, 1.5 miles of rocky road and desert scrub separate them from the main, asphalted road. Lilet is only .5 miles from the hard road and close to the *Mache Mirak* (Miracle Market), a market built and developed by Love-a-Child. Bayard is directly on the hard road. All were almost certainly not permanent habitation sites before 2004 and, although many of the residents might be there for months or even years, they are probably best understood, not as fulltime residents, but as temporary habitations. In some cases, they are part of a broader family subsistence strategy, i.e. many residents participate in other households elsewhere, either in farming communities, urban areas or the Dominican Republic. Some residents use the homes for temporary domicile, to fish, as a layover in transiting to and from the DR, and as a mechanism for accessing aid given to the village inhabitants. Some use the houses as daycare and boarding facilities for small children while themselves engaged in itinerant trade or labor. And many residents are in the process of moving either to or from the Dominican Republic. To what extent people of the community engage in the previous occupations and strategies depends on the community. As described and seen shortly, Bayard and Betel are clearly composed primarily of renters seeking temporary refuge or in a life transition.

Perhaps the most significant feature that all the lakeside communities share and that is a major factor bearing on conclusions of this study is the role of humanitarian aid agencies. Two of the three communities, Bayard and Betel, were created by aid agencies. As seen, Lilet too experienced a building boom in the form of 53 houses constructed with money from international agencies in 2002, about the same number of homes that currently exist in the community. Those houses were subsequently lost to the rising lake waters. The one community that appears organic in the sense that the houses are and always have been predominately thatch or tin roofed with no improved latrines or other obvious aid-donated features, is Kanez-Belizè. However, Kanez-Belizè is arguably the most marketed village in Haiti, available for viewing on YouTube and Vimeo in no fewer than 12 A-class videos, four different major aid agencies have posted videos making claims to having saved the Kanez-Belizè villagers from malnutrition, illiteracy and despair. Moreover, while all the villages are the targets of aid agencies, the Hotes Foundation provides an unprecedented and consistent level of aid to Kanez-Belizè daily. These relatively spectacular levels of aid are points returned to in the final sections of this report.

Figure E1: Map of the CH activity area, where the four studied communities are located. Important features of the area are, a) the paved and well maintained road leading to the major Haitian-Dominican border crossing as wells as physically close proximity to the border, b) all target communities lie in the Commune of Ganthier, historically a cattle grazing region, c) Kanez-Belizè and Lilet evolved from temporary fishing communities on the edge of the lake, d) all the communities except Betel received significant boosts in recent decades as offloading points for contraband charcoal from the DR, e) intense NGO activity that has come about from having easy access to Port-au-Prince via the border road, abundant relatively empty and inexpensive land, and scenic impoverished villages. This latter point, the influence of the NGOs, should not be gainsaid. Arguably none of these communities would exist as permanent settlements if not for the aid agencies.

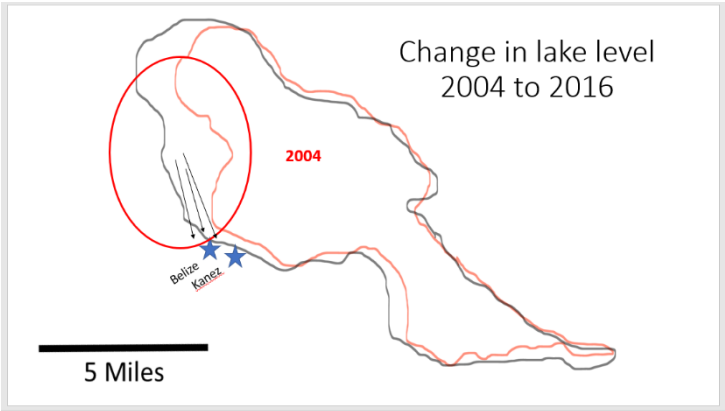


Figure E2: Map of Lake Rise. Another significant feature of the CH activity area is that between year 2004 and 2011 the lake rose from 44 to 51 sq. miles, an increase in area of 7 sq. miles (16%). The SW shores of the lake were particularly impacted. People living in Kanez-Belizè claim to come from the area where people lost land to rising waters. Congruently, there were only a few homes in the area prior to 2004.

Figure E3, Fon Bayard just after being built in 2004 vs. Figure E4, Fon Bayard in 2018

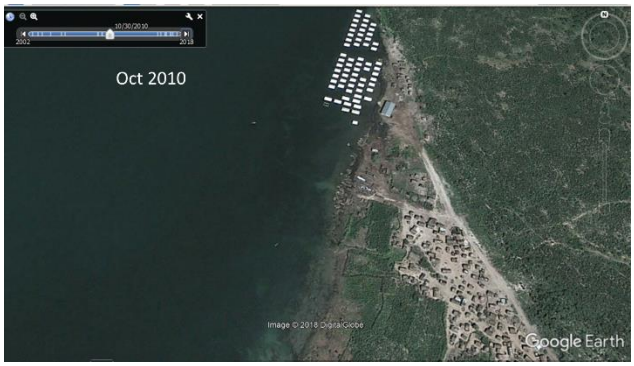


Figure E5, Lilet in 2010, note the NGO houses built in 2004 inundated vs. E6, Lilet in 2018

Figure E7, Belizè in 2002, not there are only 2 yards vs Figure E8, Belizè in 2018, note buildings

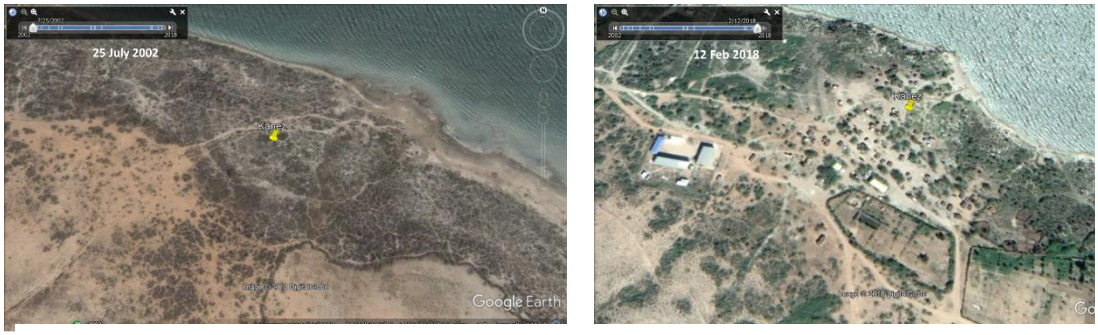


Figure E9, Kanez in 2002, note there are no houses vs. Figure E10, 2018

Figure E11, Betel in 2010, note there are no houses vs. Figure E12, Betel in 2018, houses having been built in 2012-2013

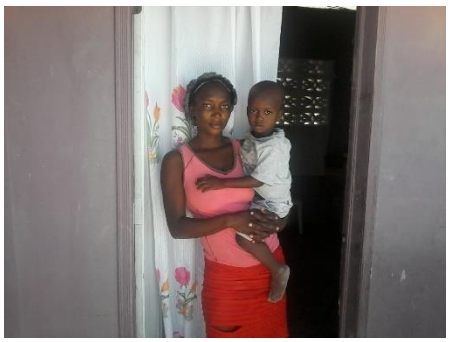
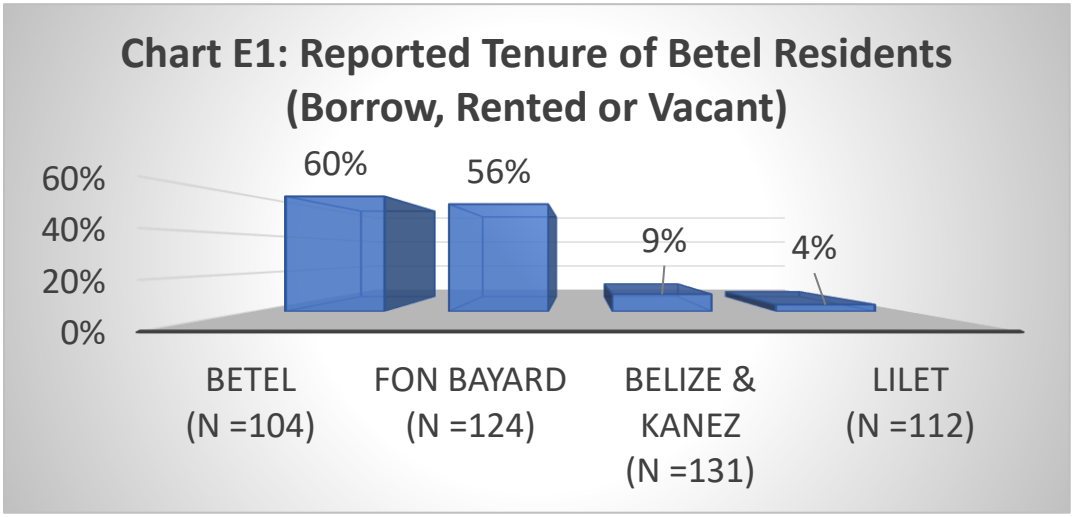


Figure E13, upper left, respondents/beneficiaries in Fond Bayard, Figure E14, above, Lilet, Figure E15, left, Betel.



Figures 14 & E15: Caribbean Harvest Pictures of Kanez-Belizè Residents

Caribbean Harvest 2014 Report

MADAN BELIZE: 60 OUT OF 69 FAMILIES HAVE BEEN MOVED

CANEZ: 40 OF 60 FAMILIES HAVE BEEN MOVED

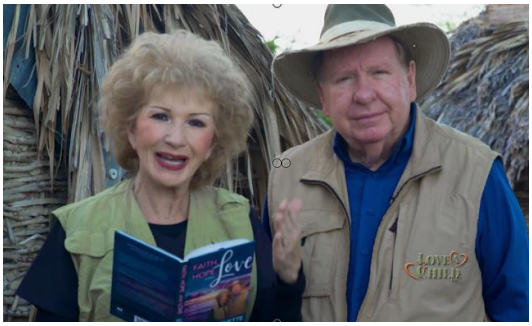
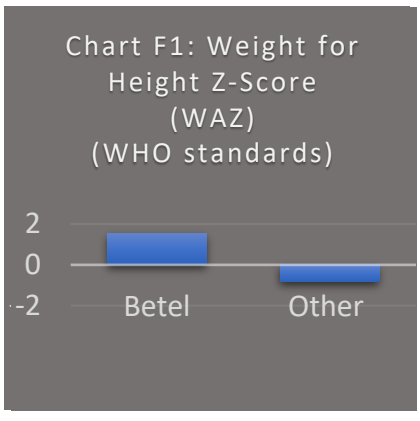


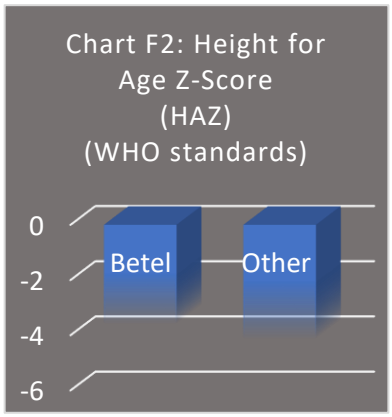
Figure E16, above, Bobby and Sherry Burnette. Founders of Love-a-Child, one of the many aid organizations that serve the area. The picture is taken in Lilet, one of the four communities CH claims to assist and that the Socio-Dig research team censused during the present evaluation. Figure E17, above right, Love-a-Child headquarters is located literally in the midst of the CH target communities. The organization supports 10 schools and makes monthly food distributions in two of the communities, Lilet and Fond Bayard. In Figure E18, right, Love-a-Child volunteers giving away part of $68,000 of food and supplies donated in 2013 specifically to Fon Bayard. Figure E19, right, and E20, right below, Love-a-Child's massive food warehouse. Figure E21, below, president of Food-for-the-Poor (FFP) visiting Fon Bayard.

F. Findings

Nutritional Test

The Socio-Dig team found better nutritional rates among the Betel children vs. those in the other communities. Chart F1, illustrates the Z-Scores for Weight for Height (WHZ), a measure of acute malnutrition (wasting). In this case the Betel children are clearly and exclusively better off than the other children. All the Betel children are also above the international average. Figure Chart F2, illustrates Height for Age (HAZ), the standard measure for chronic malnutrition (stunting). In this case there is essentially no difference between the Betel children and those measured in other villages. However, in the final category seen in Chart F3, Weight for Age (WAZ), a type of combined acute/chronic indicator of malnutrition, the "other" category of children shows a much wider distribution than Betel, skewing to 2.5 standard deviations below the mean. In contrast, none of the Betel children are less than 1 standard deviation below the mean, meaning that overall, they appear to be significantly better off nutritionally. However, it is impossible to compare Betel children because, as will be seen in section presenting "Evidence for Shortfalls in the Social Program, beginning on page 42, many of the children in Betel also live at least part-time in Kanez-Belizè and they partake in a vigorous variety of humanitarian aid programs—from school feeding to health programs—that only exist in these other communities. What we can conclude from the data is that those children in the Betel sample are not among the most malnourished children studied. Indeed, essentially none of the Betel children are among the most chronically or the most acutely malnourished children. But why and to what degree the elevated nutritional status has come about because of CH activities can only be understood by taking a closer look at CH activities versus other influences on the health of the children in all the villages.





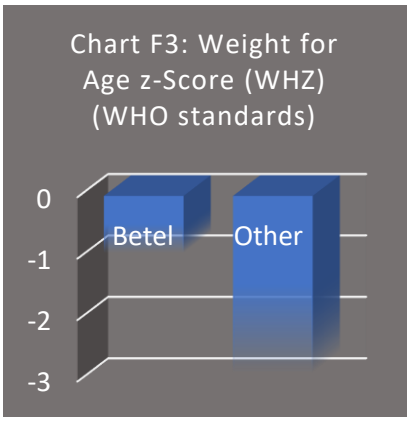


Table F1 & F2: As mentioned in the methodology section, Socio-Dig was able to obtain sample measurements of 28

Table F1: Sampled Children by Village	
Village	Number of Children measured
Betel	28
Bayard	27
Belize	11
Kanez	8
Lilet	15
Total	89

Table F2: Sampled Children Betel vs Other	
Village	Number of Children
Betel	28
Other	61

Evidence for Shortfalls in the CH Aquaculture Program

Despite the higher nutritional status of Betel children, there is little empirical evidence to suggest that CH has improved the resiliency of most project participants. This conclusion rests on two categories of findings: rather dramatic shortfalls in the Fishfarming program and equally dramatic shortfalls in the social programs. A summary outline of the evidence is,

A) Shortfalls in the fishfarming program,
   Evidence
   1) Low beneficiary participation rates and lack of cooperation among those beneficiaries who have participated. This evidence is based on surveys of beneficiaries, CH beneficiary CH reports, interviews and records kept by the CH agronomist in Betel., and admissions of CH staff.
   2) Unexpected low yields and income earned from participating in the project. The evidence is based on both reports from surveyed beneficiaries and CH beneficiary and harvest lists.
   3) The lack of reports and the existence of non-sensical reports.
   4) Visits to the cages and to the hatcheries and comparing observations and photographs from those visits to visits to other fishfarming operations.
   5) Observed Inefficiency, Negligence, as well as low observed and reported production of both Fingerlings and Fish/

B) Shortfalls in the social program,
   Evidence
   6) The weak CH social programs in Betel vis a vis strong programs in the control communities. Evidence comes from surveys of beneficiaries, interviews and information provided by CH staff (including the Social Program Director), claims and contradictions in CH reports, tax forms from CH donor and partner organization US based Social Enterprise Fund, and from observations.
   7) Lack of alternative economic opportunities in the village of Betel. The evidence comes from surveys, key information interviews, focus groups, and observation.

1. Evidence of Low Beneficiary Participation Rates

CH and Partner Claims

CH was expected to have 350 or more of what it calls "partners", meaning impoverished Haitians households that managed two or more cages and were tending fish. It was expected that at least half of these would be on Lake Azuei. From these 150 or more participating Lake Azuei fishfarmers, Socio-Dig team intended to draw a treatment sample of 30 respondents for the resiliency survey and child nutritional measurement survey. The assumption of at least 150 participatory fishfarming families was based on the following:

a) The claim the project is self-sustaining and cumulative, i.e. cage, fingerlings, and the feed only need be purchased once, from which point the production of fish covers the costs of indefinite production and expansion of the operation. [vi]
b) Claims dating back to 2009 that the model was proven successful and in fact working.[vii]
c) High expectations of growth in production, CH and partners projecting thousands of beneficiaries and production to reach 11 million lbs. of fish by 2012.[viii]
d) Hundreds and perhaps thousands of cages purchased by donors dating back to 2007. Donors include Social Enterprise Fund, the Clinton Global Initiative, Operation Blessing, FAO, World Vision, Partners in Health, Heifer International, The Spanish Corporation, Food for the Poor, Oxfam, Island Creek Oysters, Kellogg Foundation, Michael A. Peterson Foundation, Nadia and Alf Taylor Foundation, The World We Want Foundation, The Brinks Foundation, IDB, LEVE/USAID and LEVE and an unknown number of smaller private donors (see endnote for donation).[ix]
e) Repeated and widely published claims that the model was working, not least of all CH's own 2014 annual report that made the claim that average harvest was 880 pounds per cage per, with 2.5 cycles per year yielding an average annual income for participating families of $2,468. And regarding the LEVE/USAID contribution, in 2015, CH director Abe Valentine made a claim that LEVE's grant, "allowed us to double our energy output, which allowed us to add 150 more farmers…Now we have more than 400." [x]
f) Claims that fish harvested and revenues from those fish have been increasing, not least of all the claim in CH's 2014-2015 annual report that the organization harvested 518,823 lbs. of fish, 319,854 lbs. of which came from Lake Azuei. Similarly, claims from the organization that currently occupies Chairman of the board of Caribbean Harvest (the organization The World We Want) that in 2017 CH was producing 1,500 lbs. of Tilapia per day, more than ½ million pounds per year (that same year CH reported a harvest of only 94,000 lbs. of fish).[xi]
g) The complete absence of any report or information that Caribbean Harvest model has not been working. Indeed, for 12 years now, CH and its partners have maintained that the model is in fact succeeding, when in fact, based on its own quantifiable goals (increased income to fish farmers, fingerlings produced, and lbs. of fish harvested) all the evidence suggests that CH model is not now and never was even remotely successful at anything beyond attracting donors.

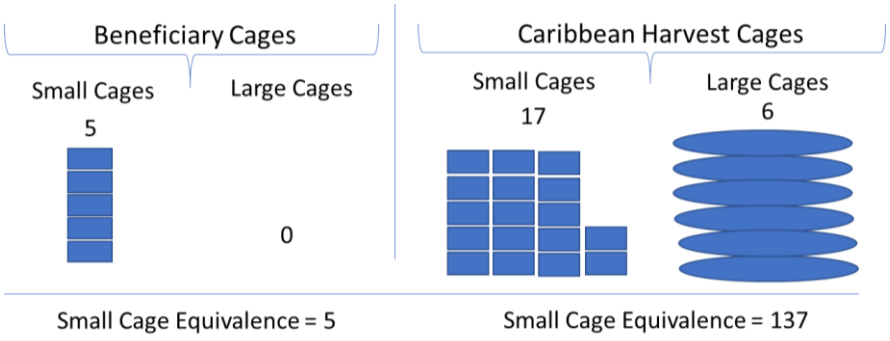
The Reality

Reported Low Participation (Village Censuses)

Between 2012 and 2016, CH suspended operations in all Lake Azuei communities except Betel.[2] At the time of the evaluation, September 8th to October 30th of 2018, there were only five cages in the water that belonged to Betel beneficiaries, and while it is not clear, those five cages appear to belong to four beneficiaries (see Figure F1). The other 17 small cages and six large cages in the water at the time of the evaluation belonged to CH, meaning only CH would partake in the profits. Moreover, one large cage has the capacity of 20 small cages, (1,200 to 2,400 fingerlings vs. 40,000 to 60,000 fingerlings). Thus, CH had the equivalent of 137 small cages belonging exclusively to the CH business vs. five small cages to be shared with beneficiaries (see Figure F2). Drawing on the CH and partner claims, these cages are purchased with money donated by organizations and individuals who believe they are sponsoring impoverished Haitian families, not private enterprise the profits of which are to be used at the discretion of the enterprise owner and board of directors. Nevertheless, even those cages belonging to and harvested exclusively for the benefit of the CH enterprise possessed few fish. CH agronomist as well as the current CH Chairman of the Board reported harvesting only 2,000 lbs. of fish in mid-October from two cages that had a production capacity of 80,000 to 120,000 lbs. of fish.

Figure F1, Cages shared with Beneficiaries (circled in red) vs Cages for Caribbean Harvest Comparison of Cages Belonging to Beneficiaries Caribbean Harvest

Figure F2, Below, Comparison of Cages Belonging to Beneficiaries vs. Caribbean Harvest



[2] At the time of the assessment CH provided cages and fingerling to beneficiaries in Lilet, but the program is financed by Oxfam and the fish, and profits are entirely under the auspices of the APMPL (Asosyasyon Peche ak Machann Pwason Lilet)

Similarly, only four of the 72 Betel respondent households in the survey reported currently having a cage. Only 13 of the Betel respondents reported ever, in the entire 12 years of the project, having a cage.

What these low numbers meant was that the original expectation that the Socio-Dig team would obtain a sample of thirty household heads and children of beneficiary families was impossible. Only three families with eligible children had ever even had a cage. Even if we consider all 313 survey respondents in all four communities—all of which at some time in the past were part of the fish cage program—we found only 43 respondents who reported ever having a cage (see Table F3), and many of these respondents had not had a cage since 2012 when tropical storm Isaac wiped out CH cages on Lake Azuei.

Table F3: Summary of Census and Cage Data by Village

Variable	Kanez-Belizè	Betel	Fon Bayard	Lilet	TOTAL
Hshd. Hd. found/available to be interviewed	71	72	82	88	313
Ever had cage in past 12 years	18	13	6	6	43
Currently have a cage in the water	0	4	0	1	5
Total number of fish harvests in community	45	25	18	7	95
Average number of harvests per beneficiary hshld.	2.5	2	3	1	2
Mean number of fish harvests per beneficiary hshld.	2	1	1.5	1	1
Average number of harvests/hshld. in the community	0.6	0.3	0.2	0.1	0.3

Documented Low Participation (CH Beneficiary and Harvest List)

CH administration did not provide the evaluation team with village census data, nor lists of beneficiaries, past or current participants. However, CH agronomist resident in Betel village did permit the Socio-Dig Team Leader to photocopy his hand-written lists of beneficiaries and harvests for the 23 months August 2015 to June 2017. Here is what the lists indicate: excluding CH itself and beneficiary schools, there were 60 beneficiaries on the list, ostensibly all living in Betel at the time they participated in the project. However, comparing those names with 72 household-respondents from the Village survey, we only found 11 matches. Five of the 48 remaining beneficiaries were located on Kanez-Belizè lists. The rest either had moved out of the area or hid their identity because they are dual residents of both Betel and Kanez-Belizè. In effect, at least a major if not the major reason for low correlation between the number of beneficiaries on the CH lists and the village census has to do with mobility of the beneficiaries and the fact that many past beneficiaries in fact no longer live in Betel.

Mobility of Respondents

The mobility of the beneficiaries is logical in view of other demographic data collected during the research. As seen in Chart E1 on page 12, fully 60 percent of people in the community of Betel are renters, implying that much of the original population relocated from Kanez-Belizè to Betel (i.e. those who rented the houses out) moved back to Kanez-Belizè or elsewhere. Similarly, if we try to answer why only 43 respondents in all four villages reported ever having a cage—and

assuming there were in fact more than 43 beneficiaries--it is notable that Fon Bayard is, like Betel, a village composed of highly mobile people where 56 percent reported being renters. Lilet and Kanez-Belizè are more difficult to explain as both are composed primarily of owners and both have participated in projects in the past. Kanez-Belizè participated in the CH project at least from 2009 to 2012 when Tropical Storm Isaac destroyed the cages, after which CH only gave cages to those Kanez-Belizè residents who agreed to relocate to Betel. Excluding the 10 cages currently in Lilet that are paid for by Oxfam and managed by APMPL (Asosyasyon Peche ak Machann Pwason Lilet), Lilet participated in the CH program as recently as 2016, but many of those cages were, according CH Director, looted and destroyed, something that has occurred repeatedly in all the villages except Betel. In Kanez-Belizè the remnants of past cages are clearly visible on the roofs of the houses, where they are used to hold thatch in place and as fence posts in goat corrals (see Figures F3 thru F8 below).

Figures F3 to F8: Remnants of CH Cages in Kanez-Belizè (specifically Madam Belizè), Used to Hold Down Thatch Roofs and as a Goat Corral

Theft, Beneficiary Negligence, and Destruction of Cages in Storms

Part of the explanation for the low number of beneficiaries has to do with the cage destruction mentioned above. The CH project has experienced repeated destruction of cages due to weather, negligence and vandalism. CH agronomists and Director also complain of chronic theft in all cage sites except Betel, where they maintain a 24-hour presence and in fact own the land on which the village was constructed. As mentioned above, in 2012, Tropical storm Isaac wiped out the cages in Kanez-Belizè. According to participants interviewed, CH agronomists blamed the Kanez-Belizè beneficiaries for the failure to save the cages from the storm. Kanez-Belizè was subsequently excluded from participation in the project and, from that time on, CH only included

those beneficiaries who agreed to move to the new village of Betel. Similarly, CH experienced theft of fish and cage destruction in Lilet and Bayard, prompting the decision to suspend the project in those communities as well. As mentioned in the previous section, the last incident occurred in March 2016 when 26 cages completely emptied of fish and destroyed in a single evening. CH reports that it was in fact beneficiaries who stole the fish. [xii]

Summary for Low Beneficiary Participation Rates

In contrast to CH claims that it would have thousands of beneficiaries by 2012-2015 and reports as recent as 2017 that they had as many as 400, the reality at the time of the assessment is that they had four aquaculture partner-beneficiaries on Lake Azuei. Moreover, during censuses of all the villages that have participated since 2006, the assessment team could only identify 43 households that ever participated in the project. Even CH lists for 2015 to 2017 had only 60 unique beneficiaries on them.

The reason that CH administration gives for low beneficiary numbers has to do with destruction of cages in bad weather, thievery, and beneficiary neglect seen above. Even these defences can be interpreted as evidence of a beneficiary discontent and rejection of the program. However, these explanations from CH leadership do not entirely jibe with reports from participations or even CH field management. When asked directly, why there are so few beneficiaries with cages, the CH Lake Azuei resident agronomist first explained the problem as principally the result of a lack of fingerlings (meaning CH has not been providing fingerling). The agronomist then expounded on the negligence and lack of interest among the beneficiaries. When the assessment Team Leader asked specifically how many beneficiaries CH had identified who were reliable partners, the response from the CH agronomist was three. Two of these are CH employees. As will be seen in Section 6 on page 33, there are many examples of negligence among CH itself, but whatever the underlying cause, the fact is that CH has few beneficiaries. At the time of the research it had only five beneficiary cages in the water and these apparently belonged to only four beneficiaries, meaning that despite claims of hundreds of Lake Azuei beneficiaries, CH had only four active beneficiaries. Two visits to Lake Peligre suggests a similar situation.[3] In the section that follows, we look at another likely contributing factor to the low beneficiary participation rates: the low income that beneficiaries receive.

[3] Oxfam sponsors another 10 cages in Lilet, but care and profit sharing regarding those cages is outside the scope of CH.

2. Evidence of Low Yields and Low Beneficiary Income Derived from Participation in the Project

CH and Partner Claims

Although the claims vary radically, the expectation based on claims from CH donors and partners' websites, online videos, and news media reports are,

a) High production, for example, "production ranges from 800 to 1,200 pound/cage after 4 months of grow-out" (Aquaculture without Frontiers 2011),

b) Significant if not fantastic increase in income to beneficiaries, for example, "families who receive starter kit … see a tenfold rise in income in their first year of participation from an average of $300 per year to nearly $3,000 per year" (Island Creek Oysters 2012),

c) Enduring beneficiary participation, for example, "the harvest cycle repeats twice a year" (The World We Want Foundation, 2014).

d) Each beneficiary household is also supposed to receive 10 percent of the fish for household consumption (see LEVE 2017 and Fish4Life 2018).

e) And in the words of Valentin himself, because, "The program is self-sustaining" in that, "after the initial investment, those families can take care of themselves," meaning the costs of production are deducted from profits to cover continued reinvestment in fish feed, materials, and cost of sales. In this way the program was supposed to be cumulative, meaning that it would continually expand from reinvested profits (Clinton Foundation 2010). Based on surveys, interviews, focus groups, and CH's own data, none of these claims are even remotely true.

The Reality

Reported Low Income (Village Censuses and Follow-up Survey of Cage-Beneficiaries)

In follow-up interviews with 28 of the 43 census respondents who reported ever having a cage, the average reported income from a harvest was $44 (2,840 HTG). The maximum income that went to a beneficiary for a single harvest was $94 (6,000 HTG) and the minimum was 0. The average number of harvests ever made for all 43 respondents was two and the median was one; 33 respondents reported ever harvesting a cage only once, eight reported two lifetime harvests, and two reported three lifetime harvests. Those are the conclusions derived from the village censuses and follow-up surveys (see Table F4).

Table F4: Income per Cage-Harvest (based on village survey responses)	
Average income per harvest (64 HTG = $1 USD)*	$44
Average number of harvests	2
Median number of harvests	1
Number of respondents reporting 1 lifetime harvest	33
Number of respondents reporting 2 lifetime harvests	8
Number of respondents reporting 3 lifetime harvests	2
Minimum income for a beneficiary from a single harvest	$0
Maximum income for a beneficiary from a single harvest	$94

*From the follow-up survey of 28 of total 43 cage beneficiaries

Documented Low Income (CH Beneficiary and Harvest List)

CH beneficiary and harvest-yield lists corroborate reports seen above from village residents and past beneficiaries regarding low income. For the 60 beneficiaries on the CH lists, the average harvest per cage was 130 lbs., yielding an average total revenue of $286. That revenue was only in part for the beneficiary. The beneficiary got 40 percent of the *profits* which, based on an interview with the current CH Chairperson of the Board of Directors, is fixed at 15 percent of the *proceeds*. What this means is that of the $286 revenue for the average cage, a beneficiary received 15 percent. Doing the math: 15 percent of $286 is $43, almost the same figure the beneficiaries in the Socio-Dig survey reported getting paid for their last harvest ($44, see Table F5). Similarly, the average number of harvests for all beneficiaries in the 23 months indicated by the records was 2.5 and a median of 1.5 harvests. More specifically, thirty of the 60 beneficiaries (50 percent) participated in only one harvest, 11 beneficiaries participated in two harvests, 17 beneficiaries participated in three to seven harvests, and two beneficiaries had 10 to 11 harvests over the course of the 23 months. Put another way, 18 percent got a 2nd harvest; 28 percent had between 3 and 7 harvests and 3 percent got 10-11 harvests. The highest total income for any beneficiary over the course of the entire 23 months was $461. That was for the individual who participated in 11 harvests.

Table F5: Summary of CH Cage Beneficiary List	
Number of individual Harvests	177
Number of individual Harvests eliminating 10 for schools & 15 for CH	152
Total beneficiaries (noting that 5 are CH employees, at least one of whom lives in Ganthier, is a school director and pastor and married to a Regional *Delegue*)	60
Average number of harvests per beneficiary	2.5
Median number of harvests per beneficiary	1.5
Number of harvests of 0 lbs.	43
Number of beneficiaries with total of 0 lbs. for all harvests	9
Number of harvests > 0 lbs.	134
Number of beneficiaries with only 1 harvest	30
Number of beneficiaries with 2 harvests	11
Number of beneficiaries with 3 to 7 harvests	17
Number of beneficiaries with 10-11 harvests	2
Total lbs. harvested by all beneficiaries before CH took its share	22,237
Remaining for beneficiaries after CH took its share	3,336
Average lbs. of fish for each harvest before CH took its share	130
Remaining for beneficiaries after CH took its share	19.5
Average value of a beneficiary's share of a harvest at $2.20/lb.	$43
Average lbs. of fish harvested if we eliminate 0-harvests	159
Average value of beneficiary share of a harvest at $2.20	$52
Total income for all fish at $2.20	$48,921
Total income for beneficiaries	$7,338

Summary for Low Beneficiary Income

However, one looks at the situation, whether we take the word of beneficiaries who responded to the census and follow up survey questions, or if we draw our conclusions from CH beneficiary and harvest lists, the reality of being a participant in CH fishfarming is a far cry from what CH has claimed for the past 12 years. Most respondents report that average income per harvest per cage is not $500 to $1,500 for 4 months. Nor is it a harvest cycle that "repeats twice per year". According to CH beneficiary lists, the average income beneficiaries earn for four to six months of care and feeding fish is $43 USD,[4] a figure that matches almost exactly the $44 derived from the beneficiary survey reports on "last harvest." Both the CH lists and survey reports tells us that most people only ever get one cage, and half of beneficiaries only ever get a single harvest.

In addition to 1/10th to 1/20th the per harvest income that CH and partners claim a beneficiary receives, feeding and tending the fish is no guarantee the beneficiary will get anything at all. Fully 28 percent of harvests recorded on the CH lists ended in 0 lbs. of fish. That means the impoverished beneficiaries fed fish three time per day for 4 to 6 months and received nothing. And despite the claim of giving 10 percent of fish to beneficiaries for household consumption, of 28 cage-owners interviewed in the follow-up survey, only one reported CH having ever given them a fish. Most insisted that it was a violation of their contract with CH. In effect, while we saw in the previous section that the number of beneficiaries are too few to evaluate, in this section we see that the rewards of participating are so much less than expected, indeed so much less than even cutting charcoal--$8 to $10 per month for participating in CH fish program vs. $8 to $10 per day cutting charcoal--that there is no economic reason to expect any correlation between participating in the CH project and resiliency.

3. Evidence: Paucity of Reports, Contradictory Data and Non-Sensical Information in Reports

Paucity of Reports

Despite repeated requests and assurances that data was forthcoming, CH never provided the Socio-Dig research team or USAID/LEVE with any financial data for years before 2014, data that would have been necessary to evaluate the impact of the 2014 LEVE/USAID contribution. The only financial data that was provided were in two reports: 2014-2015, and 2016-2017. CH did provide an annual report for 2013 and an annual report for 2014, but neither had financial data. Nevertheless, data in the reports does help to answer the question why the beneficiaries have benefitted so little and why it is highly doubtful that the Caribbean Harvest aquaculture activities have anything to do with the high nutritional status observed among Betel children.

[4] According to beneficiaries and agronomists for CH, the typical time from putting the fish in the cage until harvest, is often not 4 months, as claimed on the cited websites, but 6 months.

Radically Contradictory Data and Non-Sense

Annual Report 2013 and Big Cage Model

The 2013 report focused mostly on capacity with little data on actual accomplishments, nothing about financials and incomplete data on what any interested party would want to know: how many cages were in the water, fingerling production, pounds of fish harvested, fish meat processed and sold.

Interestingly, given the few beneficiaries currently involved in the project vs. the claims, the 2013 report suggests that the trend away from smaller cages to larger changes may have already existed at this time. The 2013 report cites "10 large cages and 48 small cages." At that time, one large cage = 10 small cages, amounting to the equivalent of 148 cages on Lake Azuei, i.e. 100 of which were for CH alone. Moreover, the report mentions a stock of "57 large cages (equivalent of 570 small cages)," but only 33 small cages, 22 of which were for fingerlings. Given that large cages are currently not shared with beneficiaries—and we found no evidence suggesting that profits from large cages were ever shared with beneficiaries-- the suggestion is that CH has long used donor dollars to purchase cages the revenues from which accrue exclusively to the CH business enterprise and not the foundation or impoverished beneficiaries for whom it was intended.

Year End Report 2014

The 2014 report contains mostly pictures, little detail, no financial data.

The only relevant data in the CH 2014 annual report that is of interest to this evaluation is the following from page 10 of the report:

> Production per cage: 880 pounds per cage per cycle/2.5 cycles per year
>
> - Actual number of farmers participating: 143 (September 30th, 2014)
>
> - Average annual revenues per farmer: $2,468

The above figures claim the amount of pounds harvested seven times greater than what was derived from the CH 2015 to 2017 data seen on page 22 (130 lbs. vs. 880 lbs.), average cycles per year is the same as what the Socio-Dig team found in surveys to be the average total cycles ever experienced by project beneficiaries (2 vs 2.5), and the claimed annual average income for farmer-beneficiaries is 28 times the project lifetime average beneficiary income Socio-Dig found in surveys ($88 vs. $2,468). If we compare the claimed average beneficiary income to that found for the two years 2015 to 2017--as derived from CH beneficiary and harvest list data--the claim is 40 times as much income for the average beneficiary in 2014 than we found in 2015 to 2017 ($2,468 for one year 2014 vs. $122 for the two years 2015 to 2017). In trying to understand the extreme differences between what Socio-Dig assessment team found and that claimed in the CH report, it may be that the CH project crashed in 2014, with production rates plunging to 1/40th what they had been in 2014. But if so, CH never reported this. On the contrary, as seen below, CH claimed increasing success and expansion of the project.

Annual Reports for 2014-2015 and 2016-2017

Contradictory Revenue Reporting

The two reports (2014-2015 and 2016-2017) do have financial data. The 2014 - 2015 report claims a total harvest of 518,823 lbs. of fish, 319,854 of which came from Lake Azuei. Sold at $2.13/lb., grossing CH $1,103,134. After expenses, the report claims a net profit of $213,447 ($137,997 of which came from Lake Azuei operations).

In 2016-2017, CH reports harvesting 93,346 lbs. of fish at $2.19/lb., which yields $204,247, less than one fifth of what CH reported in 2014-2015. The report itself incorrectly adds expenditures to revenues (see Figure F9), but when corrected, the total revenues from fish sales for 2016-2016 is ($184,823).

Figure F9: Financial Excerpt from CH 2017 Report

2017 - Financials		
	Values (HTG)	Values in USD
Revenues/Grant	23,224,237.93	351,792.08
Feed expenditures	4,928,429.00	77,006.70
Return/farmers compensation	331,248.00	4,944.25
Salaries	9,768,942.00	152,639.72
Social/community development	963,585.00	15,056.02
Other expenses	13,894,795.00	217,106.17
Depreciation	4,471,152.00	69,861.75
Total Expendures	57,582,388.93	888,406.69

Thus, based on these two reports, if the data is accurate, fish production for CH crashed in 2016-2017, going from more than half a million pounds in 2014-2016 to 93,346 lbs. in 2016-2017. Revenues plunged to a negative $184,823. Yet, in the 2016-2017 report, CH claims that revenues have steadily increased, as illustrated in this chart from page 10 of the report.

Accounting for Grant Funding

Other aspects of the reports that make the CH claims questionable are discrepancies between claims of income from the US based organization Social Enterprise Fund vs. what Social Enterprise Fund (SEF) reported on its IRS Tax form 990 (a form that all Non-Profits must file and that is available to the public). In its 2015 Form 990, SEF reported giving CH $467,153. But in the 2014-2015 report, CH only reported getting $75,000 from SEF. One possibility is that CH accounted for that money in 2015-2016 report that it did not share with the assessment team. However, during 2014, SEF reported having given CH $478,861. Similarly, the 2016-2017 CH annual report documents funding from SEF as $60,781, but SEF reported $132,274 on Form 990.

CH does not list any other grantees. thus, CH appears to have omitted some half million US dollars from 2014-2015 report and at least $60,000 from the 2016-2017 report. Similarly, CH received a $535,436 grant from the Kellogg Foundation for the 26-month period June 1, 2016 to September 30, 2018. Yet, the 2016-2017 CH report makes no mention of any money from the Kellogg foundation.

It is also not clear why CH deducted $82,100 for feed costs from 'expenditures from grants' in its 2015 report when those costs should also be accounted for in production. To clarify the extent of this deduction: at a food conversion rate of 2 lbs. of feed for every 1.5 lbs. of fish harvested, the sum of $82,100 should translate to 123,150 lbs. of fish, 29,804 more pounds of fish than CH reported harvesting in total for 2016-2017.

4. Visits to the Cages

Past Visits

Since 2012, at least three independent consultants have visited CH cages on Lake Peligre and found them empty or with few fish. The first one to report this was a team of aquaculture specialists working for the US consultant firm Landell Mills. In 2012, within the context of the Haitian Ministry of Agriculture (MARNDR)'s ACP FISH II Programme, the European Commission and the European Development funded the Landell Mills aquaculture research team to carry out a "strategic assessment of aquaculture potential in Haiti". Writing specifically about the CH Lake Peligre hatchery and cages, the consultants concluded that:

> … the site is unable to produce the fingerlings required to stock the floating cages in Lake Péligre, leaving almost all cages on the lake shore completely empty.
>
> Landell Mills Report, 2012: 77

The following year a group of Clemson University aquaculture experts made similar observations and wrote about in a refereed academic journal:

> In 2013, authors of this paper spoke with several citizens around Lake Peligre and witnessed very few cages in the water …. the major issue with aquaculture in the Central Plateau has involved fingerlings …. lack of a readily available source of fingerlings precluded the fisherman from achieving a steady source of income for their families.
>
> Plumblee et. al. 2017

Socio-Dig Visits to Cages

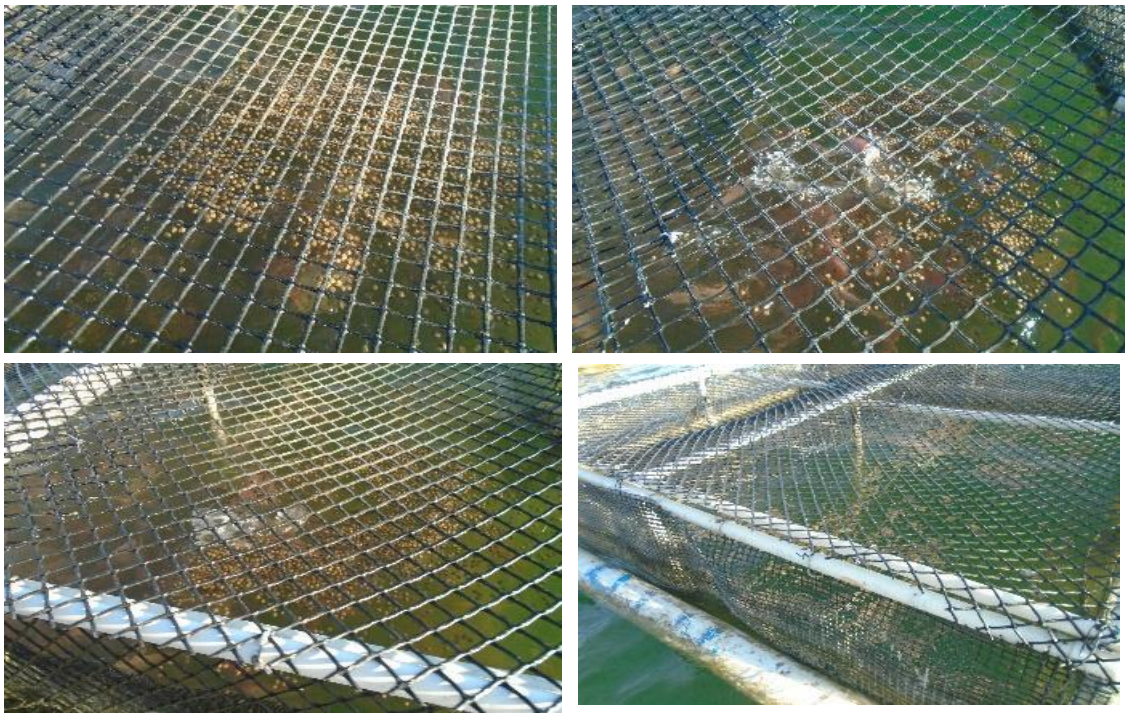
In view of the observations from earlier consultants, the discrepancies in the reports discussed above, the vast difference between claims in those reports and low harvest figures from both the CH harvest lists and survey responses, the Socio-Dig team leader visited the cages on the lakes.

Lake Peligre (October 21st 2018): Of 24 cages visited in Ba Cange on Lake Peligre, 17 were empty. The other seven had what appeared to be no more than a few dozen approximately ½ lb. size fish.

Figures F10 thru F12, top row, are three of the 17 of 24 cages on Lake Peligre that were Empty. Note that some do not even have screen covering. Others are covered with trash. Figures 13 to 15, bottom row, are pictures of three of the 7 cages that had fish. The CH fish are red and hence relatively visible even in the murky waters of Lake Peligre. Note in the middle picture the red coloring under the water, which are fish. In no cages did there appear to be more than a few dozen fish.

Lake Azuei (October 6th, 2018): When the Socio-Dig team leader visited Lake Azuei, there were 22 small cages (4 meter^3), and four 16-meter diameter cages that are 20x the capacity of the small cages (two others large cages had been harvested and beached only 3 days before the visit, i.e. during much of the evaluation there had been a total of six large cages In the lake). The CH agronomist who accompanied the team leader claimed there were ~600 fish per small cage, explaining that typically more than 50 percent of fish in the cages die. However, there did not appear to the Socio-Dig team leader to be more than a few dozen fish per cage and some cages appeared empty. The fish were so few that there little to no response to the feed cast into the cages (see Figures F16 to F19).

Figure F16 to F19: Feed Floating on surface of cages at Lake Azuei



Comparison to Taino Fish Cages

The Socio-Dig team leader makes no claim to be an aquaculture expert proficient in estimating by sight the quantity of fish in cages. However, the Socio-Dig team leader visited the other aquaculture operation on Lake Azuei, that of Taino Aqua Ferme and was able to contrast and compare the quantity of fish in the CH cages vs. those of Taino. The differences were nothing short of dramatic (see Figures F20 thru F25). All six of the Taino cages were teaming with fish. When fed, the Taino fish aggressively attached the surface and devoured the food pellets. Fish in the CH cages occupied only a small portion of the volume of the cage and their reaction to being fed was a smattering of surface strikes.

Figures F20 to F25: Comparison of Fish in Cages at Taino Aqua Ferme vs. Caribbean Harvest

Taino | Caribbean Harvest

Left column are pics from Taino Aqua Ferme 16-m^2 cages. Note that the Taino fish are grey, the color of the lake, and hence tend to blend in with the water. Right side are pics from CH 16-m^2. Note that the CH fish are red, something that CH intentionally selects for, and hence are visible in the water. In both cases the pictures were taken at feeding time. In the first row the fish are feeding. In the second row, the Taino fish are not feeding but the CH fish are. The CH picture of fish feeding was used simply because the CH cage appeared empty when the fish were not feeding. The bottom row is a comparative closeup of the schooling fish.

Corroboration for the dramatically lower numbers of fish came from the CH agronomist who accompanied the Socio-Dig team leader on his visit to the cages. The large cages on lake Azuei are equal to 20 small cages and have a potential harvest capacity of 40,000 to 60,000 lbs. of fish. Two of the large cages had been harvested within days of the visit October 21 visit (see Figure F26). The agronomist reported harvesting from these cages a total of 2,000 to 3,000 fish, ~100,000 lbs. less than should have been expected and about what CH has claimed can be harvested from a single $4m^2$ cage. LEVE staff too reported visiting the CH processing plant at that time and corroborated that there were only 2,000 lbs. of fish.

Figure F26: The two CH 16-meter cages harvested in October.

5. Observed Inefficiency, Negligence, as well as low observed and reported production of both Fingerlings and Fish

The consultant makes no claim to know why CH appears not to produce many fish, why there are so few beneficiaries, and why those few who reported participating in the project earn so little income. As seen CH blames the beneficiaries for negligence, thievery and apathy. However, a series of observations suggest that CH may be itself be responsible for low yields. Indeed, observations of the program management suggest that CH may not care how many fingerlings or pounds of fish it produces.

Cages

At the time of the assessment, CH only had 22 four-$meter^3$ cages in the water. But CH had another 82 four-$meter^3$ cages on the shores of Lake Azuei, i.e. on the dry ground, with no fish in them. There were six 16-meter diameter cages in the water, two of which were harvested in October. There was another large cage that had been empty on the shore since the beginning of the assessment in September. There were also the materials at the CH hatchery to make an unknown number of large cages (see F28). The CH agronomist resident in Betel explained that the reason so few cages were in the water was because of a lack of fingerlings.

Figure F27 to F35: Some of the many CH cages on land at Lake Azuei operations

Fingerling and Cage Mortality

As long ago as 2009, the CH Director claimed that CH produced 1 million fingerlings per year at its Lake Azuei facility (see OBI Video 2009). In its 2013 annual report (page 2), CH claimed to have doubled fingerling production from an average of 115,000 to 220,000 per month. Similarly, in a 2017 interview with RTI's Patrick Adams, the CH director reaffirmed that CH had reached an annual production rate of 2.5 million fingerlings as far back 2011 and concluded that with the new USAID/LEVE contribution, "monthly fingerling production is expected to surpass 500,000 per month" (RTI 2017).[xiii] If these claims are true, and if it is also true, as reported to the Miami Herald, that CH fish average 15 ounces at the time of harvest (Charles 2013), then we can readily infer combined fingerling and cage mortality rates in excess of 75 percent and perhaps as high as 97 percent. Looking at Table F6, to have produced 5 million fingerlings and only have harvested of 93,346 lbs. in 2016-2017—as per the annual report—CH would have experienced a 97 percent combined fingerling and cage mortality rate. Even if CH really did harvest ~500,000 lbs. in 2014-

2015, and if it really did produce 500,000 fingerlings per month—as anticipated in 2013 report—then it would have had a 90 percent combined fingerling and cage mortality rate.

Table F6: Final Fish Production in lbs. at Various Fingerling Mortality Rates (assuming average 15 once fish at harvest, as claimed by CH)						
At fingerling Capacity	Fingerling Mortality Rate					
	0%	50%	75%	90%	95%	97%
1.5 million	1,406,250 lbs	703,125 lbs.	351,563 lbs.	140,625 lbs.	70,313 lbs.	28,125 lbs.
2.5 million	2,343,750 lbs.	1,171,875 lbs.	585,938 lbs.	234,375 lbs.	117,188 lbs.	46,875 lbs.
5 million	4,687,500 lbs.	2,343,750 lbs.	1,171,875 lbs	468,750 lbs.	234,375 lbs.	93,750 lbs.

There are other reasons to believe that CH fingerling and cage mortality rates are either extraordinarily high or that CH simply does not produce near what it claims. Not least of all is that during a visit to Boucan Carre hatchery in early September, the Socio-Dig team leader observed only one of six tanks with any fingerlings. At Azuei on October 26th, the CH Director claimed 12 tanks with 20,000 fingerlings in each, all of which would have become mature in the ensuing two months. However, during that same visit the CH chair of the board noted that fingerling mortality rates had at times been as high as 80 percent. The CH Director showed the Socio-Dig team leader one tank and explained that they had lost 300 fingerlings that very day due to heat brought on by direct sunlight.

No Shade

The primary killer of fingerlings at CH hatchery is, according to the CH Director, high heat brought on by direct sunlight. Yet, CH does not now and judging from the many online videos of the hatchery dating back to 2009, never has used shade cloth to protect the fingerlings. One explanation offered by the chair of the CH board of directors was because temperatures have increased in recent years. However, historic temperature data going back to 2006 show no change in average temperatures for the area, not for the month of October—when the consultant observed the high fingerling mortality rates—nor for the hottest month of the year, August (see Table F7).

Table F7: Temperature 2006 to 2018							
	October				August		
Year	Min	Avg	Max	Year	Min	Avg	Max
2006	68	82	98	2006	73	86	98
2007	80	87	93	2007	84	84	91
2008	77	86	93	2008	73	86	100
2009	77	86	96	2009	77	88	98
2010	80	87	93	2010	77	88	100
2011	75	84	95	2011	75	85	96
2012	68	82	98	2012	75	86	96
2013	78	82	89	2013	80	83	93
2014	77	89	95	2014	86	90	95
2015	Missing			2015	78	88	100
2016	73	83	96	2016	75	87	98
2017	73	85	98	2017	77	87	98
2018	71	83	95	2018	73	87	98

WU Weather Underground at https://www.wunderground.com/

Figure F36: Mean Temperature/Month for Azuei Fish Hatchery

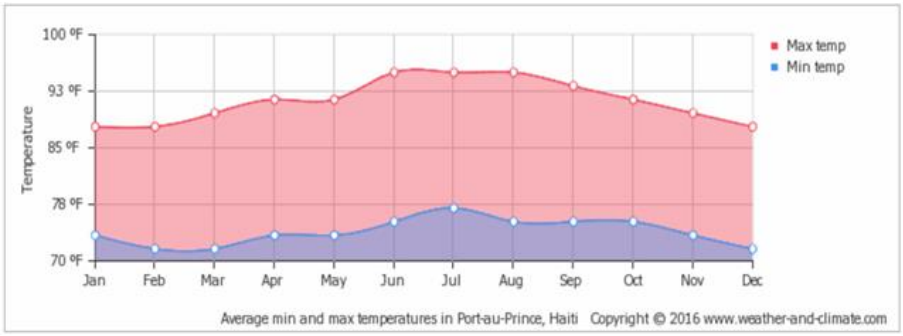


Figure F37: Top left, Valentin in 2009 in front of unprotected fish tanks (i.e. no shade screen in 2009). Figure F38, top right, 8 years later, 2017 pic from LEVE video, 26 of 36 tanks still unprotected from the sun. Figure F39, bottom left, Operation Blessing fish tank covered with shade cloth. Figure 40, bottom right, Taino Aqua Ferme fingerling tanks covered with shades cloth.

Low Aeration and Filtration

Fish need oxygen and the water they swim in must be either changed daily or intensely filtered to reduce build-up of toxic compounds from fish feces, particularly un-ionized ammonia and nitrites. Lack of oxygen and/or the buildup of toxins mean less healthy fish and higher mortality rates. Oxygen is delivered to the fish tanks through pumps and movement of the water. The water can be saturated with oxygen, alleviating the need for aeration, but It is by circulating the water through pumps that toxins can also be removed. Thus, we expect that CH fingerling tanks would be constantly filtered to facilitate health fingerlings and prevent morality. CH Director has spoken in the past of the need for aerating the water, saying in a 2010 Clinton Foundation Video that, "the tanks you see here are going to have aeration 24-hours a day." (Minute 2:40 to 2:46)." And on February 28th, 2012, Associated Press journalist Trenton Daniels, quoted the CH Director, Valentin Abe, explaining that, "extra oxygen" made possible by electricity from solar panels the Clinton Foundation donated "raises the yield of fish from 2,000 a month to 20,000."[xiv]

The 2014 LEVE grant was in part meant to address these needs. The grant doubled CH solar energy capacity so that CH could supply oxygen to the fingerlings and filter the water. But despite the claims of 24-hour oxygen and water movement, in four visits to the hatcheries, the Socio-Dig team never observed any tanks at either the Lake Azuei or the Peligre hatchery aerating or filtering the water. When asked, both CH agronomists and the Director said that the fish tanks are only oxygenated at night. Notwithstanding the claims cited above, the Director explained that the water becomes saturated with oxygen and hence it is a waste to run the pumps. Whatever the case, the Socio-Dig team leader visited three other hatcheries and fish farms and at all three there was a constant flow of pumps aerating and filtering the water.

Figure F41: Typical image of no aeration at Caribbean Harvest's Croix-de-Bouquets Hatchery

Figure F42: Aerated fingerling tanks at Taino Aqua Ferme

Figure F43: Aerated fingerling tanks at Operation Blessing's Santo Hatchery

Salt Water Shock

At least one other reason to expect high fish mortality rates is the shock of bearing and rearing fingerlings in fresh water and then introducing them directly into the Azuei brackish lake water. Taino Aqua Ferme reported finding that the shock results in mortality rates of 30 to 40 percent.

To overcome the problem, Taino installed tanks at its lakeside facility and gradually adapts the fingerlings to salt water before they are placed in cages. The CH agronomist in Betel corroborated that cage mortality rates are in excess of 50-percent but did not think the problem was related to salt water. In short, CH either does not have the problem with salt-water shock, has not considered it, or has not addressed it. Whatever the case, mortality remains extremely high for CH cage fish.

Batteries, Pumps and Fish-Feed Stock

The state of batteries at the Azuei hatchery was not determined. But during a visit to the Peligre hatchery, the consultant was shown the batteries banks and pumps. According to the CH agronomist working at the hatchery, the batteries have not functioned for at least 1 year. Nor has the filter and pump functioned for at least 1 year. The Peligre hatchery also lacked a stock of fish feed (see Figure F44 thru F46).

Figure F44: Battery bank that has not worked in over 1 year, at Lake Peligre Hatchery.

Figure F45: Filter that has not worked in over 1 year, at Lake Peligre Hatchery.

Figure F46: Empty feed warehouse at Lake Peligre Hatchery.

Lack of Other Materials and Protecting the Cages

Lake Azuei is a 33,000-acre body of water (132 km^2 or 51 $miles^2$). In the absence of any foul weather, the lake experiences mid-day winds of 20 to thirty 30 knots and waves as high as 5 feet (see Fortuné 2011 and Piasecki et. al 2016). Because average depth is only 20 meters, when weather is extreme waves can pile up quickly, making the lake especially violent. When violent weather strikes, beneficiaries and CH staff often must tend anchors and untangle lines lest the fish be lost, and/or the cages destroyed. Yet, CH has only one 11-foot long, locally made wooden dory with no motor, and one 11-foot aluminum, flat-bottom skiff equipped with a 9.9 mercury outboard motor. To move large cages the staff uses a 100-gallon plastic water tank as a float (see Figures F47 to F52). Beneficiaries do not have use of the boats and are expected to tend cages in their own boat—which most do not have—or by swimming to the cages. Anecdotes from beneficiaries, reports from CH staff, and CH communiques such as CH explanation sent to LEVE for fish stolen in Lilet in March 2016, make it clear that CH expects that the beneficiaries to rescue fish, fix anchors, and untangle lines during foul weather and to protect fish from thieves at night, all without the assistance of CH agronomists or security guards, i.e. they were expected to brave storms and save the cages and defend against thieves (something Taino Ferme accomplishes with

armed guards). Beneficiaries are somewhat ambivalent about this role. As one beneficiary put it, "what we get from Caribbean Harvest is not enough to lose my life for."

Figure F47, top left, CH's 11- foot, flat-bottom aluminum skiff with 9.9 motor, not appropriate for rough water and underpowered. Figure F48, top middle, skiff loaded with a 4-meter cage. Figure F49, top right, two of Ch's 4-meter cages wrecked by an October squall. Figure F50, below left, the 100-gallon water tank used to move 16-meter cages. Figure F51, below middle, a 16-meter cage belonging to CH (note that it is not covered to protect the fish from birds and thieves suggesting it is empty). Figure F52, bottom right, Two of Taino Aqua Ferme's 20-foot fiberglass skiffs, with rounded hulls and powered by 40 horse Yamaha engines, appropriate for rough water.

Conflicts with Staff, Beneficiaries and Firings

Another issue relevant to the impact of the project on beneficiaries is employment. While we did not gather data on employees for the entire CH history, stories of conflict and accusation are common. In the month before the evaluation, CH fired four of its six Betel employees, leaving only two employees. In the year before the evaluation, CH also fired its entire Lake Peligre staff. Last year, 2017, CH had two former employees at Lake Peligre arrested and charged with theft and destroying cages. There is also an ongoing conflict with the Lake Peligre fishing association president that partners with CH. Such conflicts are not new. In 2012, beneficiaries in Kanez-Belizè claim that CH agronomist accused them of negligence following the destruction of the cages during Tropical Storm Isaac. The head of security at that time, a beneficiary featured in at least three of Caribbean Harvest promotional videos, recounted that CH was paying him 1,250 HTG per month ($30) to safeguard the cages, something that as seen above he explained was "not enough to lose my life for." The same experiences occurred in Lilet with loss of fish and cages, accusations of theft and destruction, firing of staff, and suspension of beneficiaries.

At the level of agronomist, CH appears to have been through at least 5-resident agronomists in the past 5 years, the present one having been there the longest, three years.

In summary, the prevailing pattern among CH staff appears to be low pay, disgruntled employees, conflict, theft and accusations, and high turnover rates, all of which undoubtedly contribute to the low production seen earlier. After 12 years CH does not have a stable staff of employees, neither at Azuei nor Peligre.

Location of Hatcheries

Both Hatcheries are located over 1-hour from the lakes, down rough and sometimes impassable roads. The physical shocks of the road increase the stress on transported fingerlings and hence increase mortality. Other factors related to site selection brought condemnation from Landell Mills aquaculture experts who attributed the lack of fingerlings and fish in the cages seen earlier (see F20 thru F25) to poor site selection,

> Several project developers seem to be disconnected from the country's realities, and to ignore technical and human limitations. For example, the selection of Boucan Carré as the site for the Zanmi Lasanté hatchery is questionable, due to the poor water quality in the area (if the information given by the technicians is correct). Given that high water quality is a crucial for aquafarming, this issue has forced the project managers to purchase costly equipment, which does not seem a wise decision given the high level of technology required. Moreover, the technical knowledge required surpasses that of the staff met during the visit to the site. The result of this inconsistency is that the site is unable to produce the fingerlings required to stock the floating cages in Lake Péligre, leaving almost all cages on the lake shore completely empty.
>
> Landell Mills Report, 2012: 77)

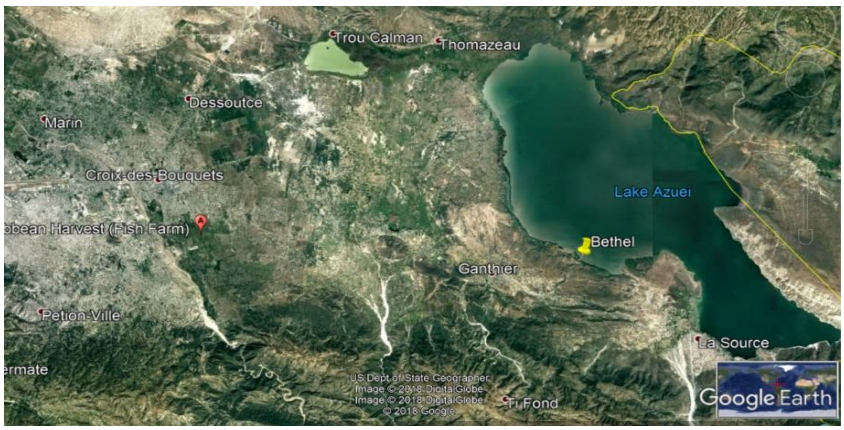


Figure F53, Croix-des-Bouquets hatchery and Betel on Lake Azuei, separated by 16 miles of road, 2.5 miles of which are extremely bad, unpaved road.

Figure F54, Lachto Hatchery near Lake Peligre, 12 miles from the lake, 10 miles of which is rocky, unpaved road.

Figure F55, One of several spots that flood on the Croix-des-Bouquets entrance to hatchery.

Evidence for Shortfalls in the Social Program

The original intention of the study was to evaluate the impact on the resiliency of beneficiaries that came about as a result of the LEVE/USAID support to CH. The primary impact was expected to come from purported increase in income of beneficiaries which, as seen in the previous sections, is negligible. However, another way that CH may have impacted beneficiary resiliency is through its social programs. CH claims to feed children, provide educational support as well as clean water, housing, and healthcare. These are all means by which the program can be expected to improve the lives of beneficiaries. Moreover, CH has consistently claimed that the money to finance these programs comes from profits generated by the partnership with beneficiaries who tend small fish cages. For this reason, we also evaluate below the claims that CH makes regarding social programs and assess if these programs could be responsible for the elevated nutritional levels found among Betel children. The findings are no more encouraging than those regarding the cages.

CH Claims

Caribbean Harvest has made claims of significant social interventions. In the words of then Chairman of the Board of Directors at Caribbean Harvest Foundation, H. Thomason Smith,

> Through its commercial fish farms Caribbean Harvest has created hundreds of jobs and moved its Haitian fish farming partners from shacks normally destroyed by each of nature's calamities to hurricane proof housing built beside Haiti's largest lake. There are currently 500 people living in our new & modern Trinity village with jobs, water, sewage and solar power. In the planning stages are a school, church and community center.
>
> H. Thomson Smith
> Chairman of the Board of Directors at Caribbean Harvest Foundation
> October 17, 2016[xv]

In the words of Director and Founder of CH summing up for USAID/LEVE 2017 video,

> With the 20 percent of our revenues that goes to the foundation, we have built housing, and already to date we have built 104 houses for underprivileged people. We sponsor 10 schools, where we pay the teachers salaries, student's uniforms, we have a medical program with the University of Florida, where twice a year they come with doctors on medical missions.

Reality

Housing

CH did participate in providing houses to selected beneficiaries. But it was not CH that paid for the houses out of its profits from aquaculture, as was claimed in the USAID/LEVE video (see

above). Food for the Poor that paid for construction of the houses. CH paid $80,000 for the land and they oversaw construction of the houses.[xvi]

After construction was completed in 2014, CH relocated 100 beneficiary households from Kanez-Belizè to Betel. Ostensibly most of the 100 houses are occupied. However, Socio-Dig team found that at least 60 percent of those beneficiaries subsequently rented the homes to 3rd parties and either moved back to the Kanez-Belizè or left the area altogether, as evidenced by rental rates summarized in Chart E1, on page 12. An unknown but significant number of those remaining are dual-residents of Kanez-Belizè and Betel. Moreover, in a pre-census of the houses, the Socio-Dig team leader estimated that 38 households were likely uninhabited. This estimate was based on apparent occupation (presence of people, curtains, buckets, cooking utensil, kitchen, and goat droppings on the porch--i.e. goats using the porch is a sign of no maintenance). [xvii]




Figures F56 thru F58 above and Figure F59, left, from LEVE video (2017), most houses in Betel appear vacant, no outside kitchen, no buckets, basins, chairs, no cloths out drying and no fence. Figures F60 thru F62, below, three examples what occupied Betel houses look like.





Figures F63, far left, the Betel Church figure F64, left, the Betel basketball court that seems to never have anyone playing on it.

Figures F65 & F66 right, some Betel residents complained to the Socio-Dig team of cracking walls.


Water

The most common complaint from Betel residents who participated in focus groups and Key Informant Interviews was the lack of water in Betel Village. The lake water is brackish and unsuitable for drinking or washing clothes. The Hotes Foundation staff in Kanez-Belize consider it unsuitable for bathing as well and cite it as a primary source of skin diseases, something that the Socio-Dig team noted were particularly common among Betel Children.

In 2013, the Gainesville, Florida Methodist Church donated $5,000 to CH for digging of a well, Living Water International drilled the well and Food for the Poor installed a desalinizer capable of purifying 250 gallons per day of the brackish well water. Neither the pump for the well nor the desalinizer were functioning at the time of the evaluation. Beneficiaries consistently claimed that the pump and desalinizer only ever worked for 3 weeks in the past 5 years.

To compensate for the lack of well water, CH claims to make bi-weekly water deliveries of 1,000 gallons (i.e. they purchase a water delivery every 14 days). Beneficiaries corroborate that deliveries occurred in the past. However, the water was consumed in a matter of days. Putting this in context, the average US citizen consumes 80 gallons of water per day, meaning a single US household of 5 people would consume 1,000 gallons of water in 2.5 days. If Betel residents consumed 1/100th the water the average US citizen consumes and the village has 500 residents—as CH claims (see H. Thomason Smith's quote at beginning of this section)--the 1,000-gallon water supply would last 2.5 days. Indeed, forget about washing clothes and bathing, at the physiologically required 0.5 gallons per day, 500 people would drink 1,000 gallons of water in 4 days.

During the best of times, beneficiaries typically must retrieve water in Fond Parisien, having to make the 6-mile round-trip on foot or pay a moto-taxi 100 HTG per 5 gallons of water ($1.50). Making matters somewhat worse, beneficiaries report that CH has recently suspended purchasing water and as of October 30th had not made a water purchase since August. CH staff recently asked beneficiaries to pool their own funds and purchase water. Socio-Dig research team's experience in the village corroborate these claims. During the 6-weeks of research, from early September to the end of October, no water deliveries were observed. At least once during the evaluation, residents pooled resources to purchase water.

One mitigating factor is that the houses in Betel all have systems to catch and store rainwater. The area is located in a desert, so the system only rarely meets the needs of villagers.

Figure F67: Cistern for catching rain at a Betel house.

Figure F68: The Desalinizer, pump, and storage tank that according to residents has worked for three weeks of the past 5 years.

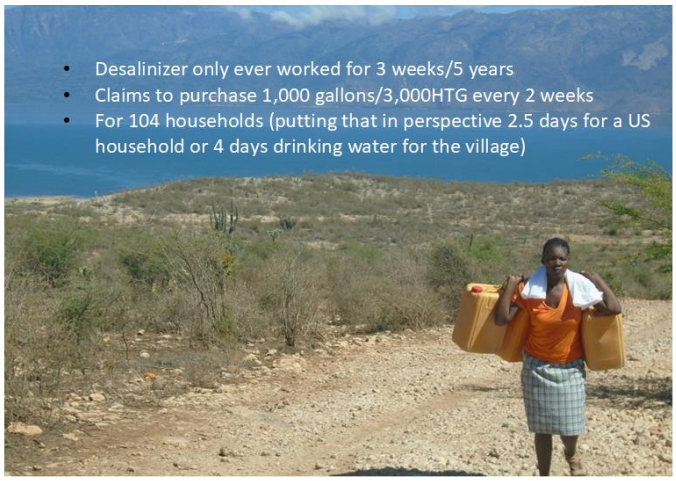


Figure F69: Betel Woman 1.5 miles into her trek to get water

Sanitation

The houses were constructed with indoor flush toilets. Most of these toilets are not in use. The septic tanks and connecting PVC pipes are of questionable quality, the septic tanks reportedly too shallow and the PVC of a schedule that is thin and easily breakable (see Figure E71). The upshot is that the vast majority of the people of Betel do not have latrines. Not even the church/school has a functioning latrine. Residents of Betel defecate on the shore of the lake or in the bush surrounding Betel.

Figure F70: Pipe and septic tank.

Figure 71: Broken septic pipe and septic tank.

Education

The CH Social Program Director did not corroborate CH founder's claim to support 10 schools and pay teacher's salaries. The only support the Social Director reported that CH gives is to,

- 98 students at a K to 2nd grade school CH created and houses in empty Betel houses and a church built by a US evangelical mission.
- Tuition for 21 high school students at 4 schools

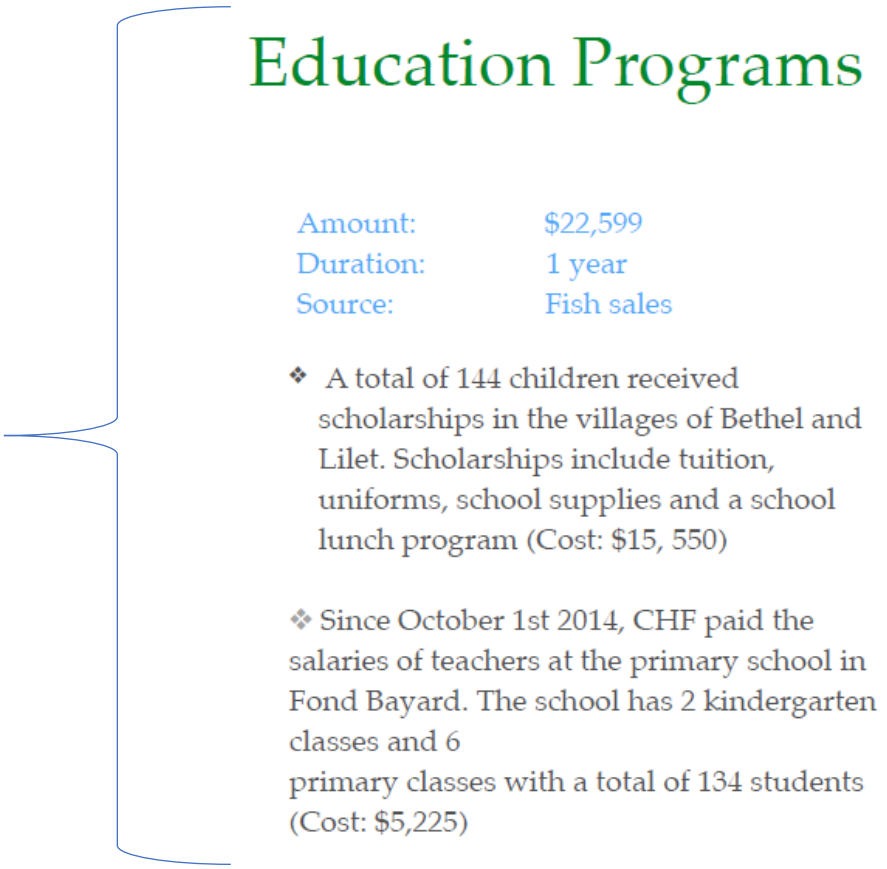
Table F8: CH Education Expenses in 2018		
Grade Levels	Number of Students	Cost
K-2nd grade	98	$ 4,828.57
High school students CH pays for	15	$ 1,000.00
	2	$ 318.57
	3	$ 428.57
	1	$ 192.86
TOTAL	**119**	**$ 6,768.57**

The CH Social Program director made no mention of any other contributions. On the contrary, he said that CH funds are depleted due to reduced donations and that CH has had to reduce educational expenses. Moreover, the claim that CH pays educational expenses from aquaculture profits is questionable. In its 2014-2015 report, CH claimed it had spent $22,599 on educational activities and that the source of the money was, specifically, "Fish Sales." But in its 2015 IRS form 990, the Social Enterprise Fund (SEF) reported having made a cash transfer to CH of $24,000, money specifically designated, "To support the Bethel School in Haiti" (see F73 on the following page). Because of the lack of financial data and incomplete reporting, this was only year that could be evaluated.

Figure F72: Betel children on their way to school in Kanez-

Although certainly a noble idea, assistance with education is arguably not among the most significant needs of residents in the area. The area within walking distance of Betel and the other communities that CH claims to assist has a multitude of internationally supported pre-schools and primary schools. The supporting organizations include Hotes Foundation, Love-a-Child, Operational Blessing, and Foi et Joie of the Catholic Church, all of which have dedicated school buildings, international teaching standards and that feed the children twice per school day. In contrast, the Betel school classes are held in vacant Betel houses and the evangelical church, and despite claims to feed, no feeding occurred during the period of evaluation, September to October 2018.

Figure F73



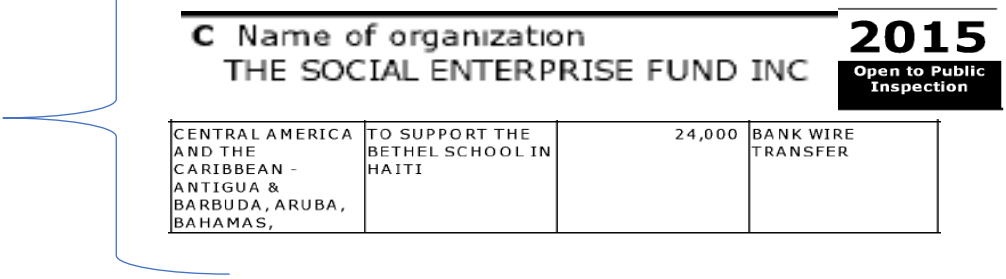
Education Programs

Amount: $22,599
Duration: 1 year
Source: Fish sales

- A total of 144 children received scholarships in the villages of Bethel and Lilet. Scholarships include tuition, uniforms, school supplies and a school lunch program (Cost: $15, 550)

- Since October 1st 2014, CHF paid the salaries of teachers at the primary school in Fond Bayard. The school has 2 kindergarten classes and 6 primary classes with a total of 134 students (Cost: $5,225)

Figure F74



C Name of organization
THE SOCIAL ENTERPRISE FUND INC

2015
Open to Public Inspection

CENTRAL AMERICA AND THE CARIBBEAN - ANTIGUA & BARBUDA, ARUBA, BAHAMAS,	TO SUPPORT THE BETHEL SCHOOL IN HAITI	24,000	BANK WIRE TRANSFER

Figure F73, is an excerpt from CH's 2014-2015 Annual report in which it claims to support education programs using aquaculture profits as a source. The CH report makes no mention of additional expenses or other sources of educational funds. Figure F74, is an excerpt from SEF (Social Enterprise Fund) 2015 IRS form 990, available to the public online. As can be seen from the excerpt, SEF sent a cash transfer to CH of $24,000, money specifically meant "To support the Bethel School in Haiti." Because of the lack of financial data and incomplete reporting, this was only year that could be evaluated.

Figure F74, distribution of primary and secondary schools within walking distance of Betel.

Figure F75: Foi and Joie pre-school in Balan

Figure F76: Hotes pre-school in Kanez-Belizè

Figure F77: A Love-a-Child primary school

Figure F78: The Operation Blessing primary school in Kanez-Belizè

Health Care

CH "Healthcare System" consists of bi-annual visits from a team of faculty and students from the University of Florida (UF) School of Pharmacy. But the impact of this program in terms of resiliency and the enduring health of the Betel villagers is, as with education, questionable. There already exists an integrated local system of eight internationally supported, fulltime clinics and hospitals, including a clinic in Kanez-Belizè, the community from where the Betel residents were supposed to have been relocated. All these facilities are within five miles of Betel (see Figure F81). There are also at least two mobile clinics staffed by local doctors that periodically visit Lilet and Fon Bayard, one staffed and supported by the organization Love-a-Child and the other by the Haitian organization OCMA. Operation Blessing claims to hold a weekly health clinic in its Kanez-Belizè primary school. Caribbean Harvest and the University of Florida are not a part of any of these systems and apparently at no time in the past four years has any representative of UF or CH attempted to identify existing healthcare services or contact representatives of those organizations. Over the course of the evaluation, the Socio-Team leader interviewed five representatives of clinics and hospitals close to Betel, none were aware of the University of Florida/CH program. In short, the intentions of the CH/UF health program are not clear as there is already a robust, internationally sponsored healthcare system in place, one which CH/UF has apparently made no attempts to integrate into or reinforce. This point is borne out by responses from the Socio-Dig village censuses. When asked where they or someone in their house last consulted a healthcare professional, only 12 0f 302 respondents reported their last visit being with UF/CH (UF doctors in fact spent 2 days visiting during the same period of the evaluation); 6 of these respondents were from Betel. In contrast, 132 respondents cited Love-a-Child health clinic, 32 of whom were from Betel.

Figure F79, UF School of Pharmacy team at Belizè

Figure F80, Valentin Abe of CH & leaders UF School of Pharmacy team at Betel

.

Table F9: Where Village Residents Seek Medical Care (Socio-dig Survey)					
Clinic/Hospital	Kanez-Belizè (n=71)	Betel (n=62)	Fon Bayard (n=81)	Lilet (n=88)	Total (n=302)
Christ for All	0%	8%	11%	2%	5%
Hotes	31%	0%	0%	0%	7%
L'Eau de Vie	0%	3%	10%	0%	3%
Love-a-Child	48%	53%	40%	52%	48%
Toman	1%	3%	5%	5%	4%
CH/UF Mobile clinic	7%	10%	1%	0%	4%
Other	8%	21%	12%	20%	16%
Did not go/Do not	4%	2%	21%	20%	13%

Figure F81. Right, distribution of clinics and hospitals frequented by people of studied communities

Figure F82, far left, Love-a-Child staff sorting meds. Figure F83, left, Love-a-Child mobile clinic. Figure F84, below, Love-a-Child clinic and hospital, open every day.

Figure F85 top left, and F86, top far right, d'Leau Lavi clinic, open every day. Figure F87 below, Hotes Clinic in Kanez-Belizè. Figure F88, below, far right, OCMA mobile clinic in Lilet.

CH in Betel vs Hotes in Kanez-Belizè

At the same time in 2014 that CH thought it was relocating 100 of 129 Kanez-Belizè residents to a better life in the new village of Betel, the Hotes Foundation arrived in Kanez-Belizè. Over the course of the four years since their arrival, Hotes has launched an assistance and community development campaign so comprehensive vis a vis the superficial social programs claimed by Caribbean Harvest, seen above, that it should erase any suggestion that higher nutritional levels found among Betel children have anything to do with CH. Indeed, the higher rates almost certainly have something to do with the dual-residency of many Kanez-Belizè residents. Specifically, the Hotes Foundation,

- Brought in a hi-tech mobile kitchen that feeds all Kanez-Belizè women and children a hot meal with meat five days per week
- Installed 20 toilets and showers that function and have water supply replenished daily
- Installed a 100kw generator
- Installed six 1,000-gallon water tanks
- Drilled three wells that pump clean, brackish water, 24 hours per day
- Provided each household with 20 gallons of drinking water per week, every week
- Installed and maintained an airconditioned pre-school with full-time staff that cares for all pre-kindergarten Kanez-Belizè children from 8 am until 12 pm five days per week.
- Installed an onsite airconditioned 6-room clinic and maternity ward staffed with daytime nurse
- Installed a 100 x 40-foot community center and tables that doubles as a cafeteria and study hall
- Built and maintained a tree nursery and irrigated vegetable garden, complete with two 2,000-gallon rainwater basins that, in the absence of rain, are filled with water trucked from Fon Parisien
- Built and maintained a professional size soccer field complete with scoreboard and bleachers
- Organized a girl's soccer league, to promote self-esteem and female participation in leadership
- Built and maintained a community park and outside amphitheater
- Maintained a permanent adult literacy program
- Maintained a community health education program
- Maintained a pre and post-natal maternity program with bi-weekly checkups
- Instituted a music education program

All the preceding is maintained and staffed with support from five Haitian professionals and 20 fulltime positions for pre-school teachers, garbage and clean-up crew, nursery and garden attendants, cooks, tutors, and nurse auxiliaries. All 20 non-professional positions are filled locally, by members of the Kanez-Belizè community who rotate into the positions, the objective being that Kanez-Belizè households get equal opportunity for employment and income. Hotes has also launched a 200-acre forestation campaign that admittingly failed but which they have continued to adapt to the local environment. The organization has held field-days and Christmas pageants that can be viewed online at YouTube. Whatever the end result of the Hotes development program, the consultant has never, in 30 years of working in development and conducting

research in Haiti, witnessed a comparably pervasive and all-inclusive community assistance program. The program is especially dramatic vis a vis the largely vacant program that Caribbean Harvest claims to operate in Betel. Indeed, lest the point be missed, all the original residents of Betel qualify and most participate as beneficiaries of the Hotes programs. Moreover, all that is described above is in addition to free primary school education at the Operation-Blessing school in Kanez-Belizè the goes up to the 6th grade and where they are fed a breakfast snack and hot lunch each school day. Operation Blessing gives approximately half those children scholarships to secondary schools.

Hotes Foundation in Belizè Kanez

Figure F89: entrance to park and outdoor theater

Figure F90: Football bleachers

Figure F91: Scoreboard

Figure F92: One of three wells.

Figure F93: tree nursery

Figure F94: Cooks cleaning chicken

Figure F95: some of the showers and toilets

Figure F96: Modern mobile kitchen

Figure F97: Lunchtime

Figure F98: Hotes Field-day in Kanez-Belizè

Figure F99: Billionaire Richard Hotes filling wheel barrow

Figure F100: Child at Operation Blessing school in Kanez-Belizè eating lunch

A. Conclusion

No matter how one approaches the CH fishfarming program, whether because of weather, beneficiary negligence, thievery, and apathy or because of CH's own negligence, all indications are that CH has performed dramatically short of claims. How short based on CH's own internal monitoring and records is not clear because reports and data were not forthcoming and those provided have inconsistent and incomplete data and make contradictory and sometimes illogical claims. Nevertheless, we make our conclusions based on concordance of the data Socio-Dig collected in surveys and the CH agronomist records from Betel, all supported by observation, extensive interviews and focus groups with stakeholders.

As a result, the planned impact of the USAID/LEVE intervention is difficult to measure. Specifically, there were not enough current beneficiaries on Lake Azul to make up a sample (there were only four with a grand total of five cages). Nor were there enough recent beneficiaries. In censuses of all the villages where CH has been active on Lake Azuei since 2007, Socio-Dig found only 43 beneficiaries who reported ever having had a cage. Half of those beneficiaries report having had a cage for only a single harvest, and about half were beneficiaries six years in the past. Only 11 were currently found living in Betel. A visit to Lake Peligre revealed similar conflict, low program activity, and frustration among beneficiaries. Thus, the study focused primarily on why there were no beneficiaries, the shortfails in the claimed social programs, all of which was definitively and dramatically less than claimed by the CH directorship and partners.

B. WORKS CITED

Abe, Valentin Ph.D. 2014. Risk Management in Aquaculture: Case Study of Haiti. Executive Director, Caribbean Harvest Foundation. Port-au-Prince, Haiti. http://www.agriskmanagementforum.org/content/risk-management-aquaculture-case-study-haiti

Bo-eun, Kim, 2013. “Supporting sustainable fish farming in Haiti”, In the Korean Times. 2013-03-31. http://m.koreatimes.co.kr/phone/news/view.jsp?req_newsidx=133095

Brass, Jane. 1991. "Social, Economic, and Cultural Considerations for Saltwater Cage Culture of Florida Red Tilapia in Northeastern Haiti."

Caribbean Harvest Foundation Annual Report – 2015

Caribbean Harvest Foundation Annual Report - October 2017

Caribbean Harvest Foundation. Status Report And Outlook For 2013-2014 (August 31, 2013)

Caribbean Harvest Year End Report 2014

CECI. Réville, J.P. 1988 Rapport de mission sur l‟implantation d‟étangs ruraux à Saint

Michel de l‟Attalaye

Charles, Jacqueline. 2013. Fish cages bring economic hope to Haitians. Miami Herald. July 04, 2013 06:14 PM.

Chounoune, F. Jackson. 1998 Fish Culture Projects. Bulletin vol 11 n°1 Some fisheries and aquaculture projects in Haiti. International Center for Aquaculture Auburn University Agricultural

Chounoune, Jackson. 1998. “Some fisheries and aquaculture projects in Haiti.” EC Fisheries Cooperation Bulletin, 11(1). Accessed September 10. http://ec.europa.eu/development/body/publications/fish/pe039823.pdf

Clinton Foundation, 2012. “Caribbean Harvest.” https://www.clintonfoundation.org/our-work/clinton-foundation-haiti/programs/caribbean-harvest

Daniel, Trenton. 2012. “Haiti seeks to rebuild, or just build, power grid”. The Associated Press

DANIEL, TRENTON. 2012. Haiti seeks to rebuild, or just build, power grid. The Associated Press.

Dyer, Candice. 2010. The Fish Farmer’s Story. Auburn Magazine. 8/2/10

Engle, Jonah. 2009. “Bill Clinton leads largest business delegation to Haiti”. Port-au-Prince, October 1, 2009. Article originally published in the Haitian Times, October 2, 2009

Fish Farming in Haiti: Part III

Posted by STEVE MIDWAY on JUNE 25, 2012

Fish4Life 2018. Fish4Life and Caribbean Harvest are implementing this expression in real terms, and into entire communities to drive tremendous economic and social impact.

Fish4Life 2018. Webpage. https://www.fish4life.org/the-impact/

Food & Agriculture Organization (FAO). 2016. “State of World Fisheries and Aquaculture.” United Nations. Accessed September 2016. http://www.fao.org/3/a-i5555e.pdf

Fortuné, Jodany. 2011. Environmental impacts on Lake Azuéï in Haiti due to degradation of its watershed. fjodanyg@yahoo.fr ou jodanyfortune76@gmail.com November 03, 2011 University of Puerto Rico, RP

Gordon, Aaron, and Jeffery Plumblee, Guy Higdon, Ian Davis, John E. Walker, David Vaughn. 2017. Engineering Aquaculture in Rural Haiti: A Case Study. International Journal for Service Learning in Engineering, Humanitarian Engineering and Social Entrepreneurship Vol. 12, No. 2, pp. 15-33, Fall 2017 ISSN 1555-9033

Haiti Libre Relevant articles on Haiti fishfarming from the Haitian newspaper, the Haiti Libre

http://www.haitilibre.com/en/news-13270-haiti-agriculture-the-caribbean-harvest-will-double-its-production-of-tilapia.html

http://www.haitilibre.com/en/news-13228-haiti-economy-the-association-of-industry-of-haiti-appealed-to-leve-project.html
http://www.haitilibre.com/en/news-10816-haiti-economy-launch-of-the-project-leve-in-the-north.html
http://www.haitilibre.com/en/news-9557-haiti-agriculture-aquaculture-and-fishing-an-economic-opportunity-for-haiti.html
http://www.haitilibre.com/en/news-8709-haiti-agriculture-new-hill-lake.html
http://www.haitilibre.com/en/news-8019-haiti-agriculture-the-beekeeping-and-aquaculture-receive-government-assistance.html
http://www.haitilibre.com/en/news-8101-haiti-agriculture-the-government-support-to-200-the-development-of-hill-lakes.html
http://www.haitilibre.com/en/news-6596-haiti-agriculture-an-aquaponics-farm-in-grace-village.html
http://www.haitilibre.com/en/news-6564-haiti-agriculture-aquaculture-a-solution-for-the-future.html
http://www.haitilibre.com/en/news-5078-haiti-agriculture-aquaculture-in-macary-receives-assistance-from-spain.html

Hargreaves, John A. Tilapia Aquaculture In Haiti. Aquaculture without Frontiers Volunteer. Farmer to Farmer Program. 8-16 April 2011

Hargreaves, John A. 2012. Developing Tilapia Aquaculture In Haiti: Opportunities, Constraints, And Action Items Proceedings Of A Workshop Sponsored By Novus International, Aquaculture Without Frontiers, The World Aquaculture Society, And The Marine Biological Laboratory Edited. Aquaculture Assessments LLC

Hargreaves, John A., Craig Browdy, Bill Mebane, Dave Conley, and Valentin Abe. 2012. "Developing Tilapia Aquaculture in Haiti: Opportunities, Constraints, and Action Items." Proceedings of a workshops sponsored by NOVUS International, Aquaculture without Frontiers, the World Aquaculture Society, and the Marine Biological Laboratory. New Orleans: Aquaculture Assessments.

Hargreaves, John. 2011. “Tilapia Aquaculture in Haiti.” Aquaculture without Frontiers. http://www.mbl.edu/sai/files/2012/05/Hargreaves-April-2011-Trip-Report.pdf

Hargreaves, John. 2012. "Developing Tilapia Aquaculture in Haiti: Opportunities, Constraints, and Action Items."

Hill, Megan and Kate Davenport, and Margie Brand. 2008. FINAL REPORT Prepared for USAID’s IDEJEN Program by EcoVentures International www.eco-ventures.org Prepared by: November 2008

ICO Friends For Haiti Foundation Overview And Event Goals

https://www.islandcreekfoundation.org/wp-content/uploads/2012/03/Sponsorship-Package.pdf

JICA 2009. Final Country Report: Haiti – Formulation of a Master Plan on Sustainable Use of Fisheries Resources for Coastal Community Development

Landell Mills. 2012 Final technical report STRATEGIC ASSESSMENT OF AQUACULTURE POTENTIAL IN HAITI, 2012 Project Ref. Number: N° CAR/3.1/B12 Region: Caribbean Country: Haiti October 2012 Project implemented by: Landell Mills "Strengthening Fisheries Management in ACP Countries

Landell Mills. 2012. Strategic Assessment of Aquaculture Potential in Haiti. ACPFish II. http://acpfish2

eu.org/uploads/projects/id153/Final%20Technical%20report%20CAR-3.1-B12.pdf

LEVE 2014. Value Chain Assessment Annex 3. Agribusiness Sector Assessment Local Enterprise and Value Chain Enhancement (LEVE) Project https://haitileveproject.org/wp-content/uploads/2015/06/Annex-3.-LEVE-Agribusiness-Sector-Assessment.pdf

LEVE. 2016. Report on Local Fish Feed Production Opportunities LOCAL ENTERPRISE AND VALUE CHAIN ENHANCEMENT (LEVE) PROJECT. RTI International

Lovell, R.T. and D.D. Moss. 1971. Fishculture Survey Report for Haiti International Center for Aquaculture and Fisheries and Allied Aquacultures. Auburn University, Alabama.

MARNDR 2010. Programme National pour le Développement de L’Aquaculture en Haïti 2010-2014.

Matsuda, Yoshiaki. 1978. "The Growth of Aquaculture in Developing Countries: Potentials, Patterns and Pitfalls." Fisheries 3 (4).

Matthes, Hubert. 1988. Evaluation de la Situation de la Pêche sur les Lacs en Haiti. Augumentation de la production de poissons en Haitipar l’Aquaculture et la Peche Continentale. FAO Project HAI/88/003. 48 p.

Miller, J.W. 1987 Proposition d'Étude pour un Projet de Développement de la Pêche

Continentale en Haïti sur Lac Peligre, Étang Saumâtre et l'Étang de Miragoane

Miller, James. 2015. Rapid Fisheries Sector Assessment – Three Bays National Park. The Nature Conservancy Report. 49 p.

Nouvelliste. 2011. Valentin Abe, le géniteur de Caribbean Harvest. Publié le 2011-11-22 | Le Nouvelliste

Nouvelliste. 2015. Après les écloseries et la fondation, Caribbean Harvest a son usine d'emballage. Publié le 2015-03-03 | Le Nouvelliste

Nouvelliste. 2015. Haïti - Agriculture : La Caribbean Harvest va doubler sa production de tilapia. 27/02/2015 10:37:51

Nouvelliste: Relevant articles on Haiti fishfarming from the Haitian newspaper, the Nouvelliste

https://www.lenouvelliste.com/article/142095/after-hatcheries-and-the-foundation-caribbean-harvest-has-its-packaging-plant

https://lenouvelliste.com/lenouvelliste/article/143082/Et-si-lon-venait-a-questionner-la-rentabilite-du-projet-national-des-lacs-collinaires-PNCL

http://lenouvelliste.com/article/21208/experience-encourageante-de-la-culture-du-tilapia

NRG. 2012. NRG Completes First Two Projects under $1 Million Clinton Global Initiative Commitment to Build Solar Energy Sites in Haiti. March 07, 2012 02:04 PM. www.nrgenergy.com/haiti/index.htm

October 2009 Updated in December 20111

OSE (Office of the Special Envoy). 2010. June 2009-December 2010.

Piasecki, Michael and Mahrokh Moknatian, Fred Moshary, Joseph Cleto, Yolanda Leon. 2016. "Bathymetric Survey for Lakes Azuei and Enriquillo, Hispaniola." City University of New York (CUNY) CUNY Academic Works.

PNUD, FAO, 1988 Gouvernement d'Haïti. Rapport de Mission d'Évaluation Conjoint du

Projet de Développement de l'Aquaculture Rurale en Haiti-HAI/84/010. Mission 27/11-

9/12/88. PNUD/FAO/Gouvernement d'Haiti. Membres de la Mission: Pedro Noriega-Curtis,

PNUD-Chef d'Équipe; Richard L'Heureux-FAO; Calixte Clerismé-MARNDR-GOH; Frantz

Bissainthe-CPNAP-GOH

Programme National de Lacs Collinaires. 2012. Report on 100 Lacs Collinaires Constuit par le programme Nationale. 132 p. (Wilson Celestin managed this program which constructed 100 lakes).

Smith, H. Thompson (Tom). 2016. HELP FOR HAITI!. Chairman of the Board of Directors at Caribbean Harvest Foundation. Published on October 17, 2016.

Snow, Erin. 2012. Cage Fishing Project Improves Output in Haiti. Accessed August 2016. http://www.heifer.org/join-the-conversation/blog/2012/November/cage-fishing-project-improves-output-in-haiti.html.

Soderberg, R.W. 2014. Environmental Assessment for Lake Azuei Tilapia Cage Farm. 12 p.

The World We Want Foundation. Annual Report 2014

The World We Want Foundation. Annual Report 2017

USAID 2017a. Enumerator Guidance: Full Model. A GUIDE FOR IMPLEMENTING A RESILIENCE MODULE

USAID 2017b. Resilience Measurement Options HOUSEHOLD QUESTIONNAIRE: FULL MODEL.

USAID. 2006. Proceedings of the Fish Feeds Forum. Fisheries Investment for Sustainable Harvest Project. USAID. Coop. Agreement: 617-A-00-05-00003-00. Auburn Fisheries Dept.

Watkins, Tate. 2012. Valentin Abe is spawning fish farmers in Haiti, lack of formal property rights be damned. January 29, 2012.

Weis, Carol and Walt Ratterman. 2011. Renewable Energy Healthcare in Haiti. Published In: South East Shipping News. Issue #142, April / May 2011

Yuwei, Zhang. 2012. Trina brings energy and life to Haiti. New York (China Daily). Updated: 2012-03-23 11:06

C. APPENDICES

Appendix 1: The Origins and History of Caribbean Harvest

According to Caribbean Harvest and Social Enterprise Websites, Caribbean Harvest was created in association with Social Enterprise Fund (SEF) and GATHAPHY. SEF in fact came into existence at the exact same time as Caribbean Harvest and as seen below, had the same board of directors. GATHAPHY is sometimes billed as an "organization that specializes in small scale water projects in Haiti" (see EcoVentures/USAID), and in fact stands for Groupe pour l'Assistance Technique aux Potiers et à la Petite Hydraulique des Mornes (Group for the technical assistance to the potters and the small rural water projects).

- Social Enterprise Fund (licensed in 2007)
- GATAPHY, existing Haitian organization

Board of Directors

Social Enterprise Fund

H. Thompson Smith- Chairman of the Board
George L. Mackay - Vice Chairman of the Board & Secretary
Paul W. Morgan- Vice Chairman & Treasurer
Valentin Abe, Ph. D.- Director & Chief Operating Officer
Larry Bentley - Director
Dennis Bernard - Director
Denise Cipriano – Director
David Krepco- Director
Ronald Raike - Director

Caribbean Harvest

Dr. Valentin Abe
H. Thompson Smith
Paul W. Morgan
George L. Mackay
Patrick Vilaire

Before 2009, neither Caribbean Harvest nor its founder Valentin Abe, Ph.D., appear in any internet searches, nor articles (academic or otherwise). Not even Abe's dissertation comes up on an internet search (Wayback Machine).

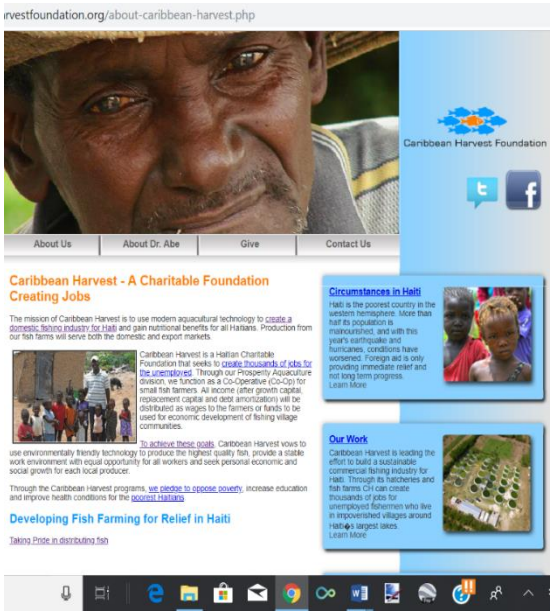
In 2009, Paul Farmer brought the Caribbean Harvest Project to the attention of first Pat Robertson's foreign assistance organization, Operation Blessing and second Bill Clinton. Both were captivated by the concept behind the project and began to support it both financially and in terms of publicity. Operation Blessing aired the project on its Christian Broadcasting Network and Clinton mentioned Abe in several interviews. Most notably Bill Clinton was quoted saying,

> "This is the biggest return on an investment under $1 million for people to chart their own course in life that I have yet seen. It's stunning. It's amazing.""

Bill Clinton was at that time the UN Special Envoy to Haiti and his wife Hillary Clinton was the US Secretary of State. Largely due to Clinton's support and almost certainly influenced by the media and humanitarian aid storm following the 2010 Haiti earthquake, Abe was named a Time Magazine 100 most influential people in 2010. Clinton wrote the conspectus.

Following the Time piece Abe and Caribbean Harvest achieved a type of celebrity status. It was at this time that the Caribbean Harvest and Social Enterprise Fund sites appear.

- Socialenterprisefund.org In January 2010
- Caribbeanharvest.org on June 26, 2011 and May 28, 2013



The sites shared a similar tone and language. The more important points,

- CH founded in 2005 by Dr. Valentin Abe, "a world renowned agronomist"
- His recent Haiti work (2005-2010) "confirmed the technology practiced in the Auburn Aquacultural Laboratories."

"Proving that."

- "**Caribbean Harvest through Prosperity Aquaculture** can create jobs essentially as fast as it receives funding…"

- 2 cages plus start up materials = $2,200 (creating one job and $3,000 per year in income).
- For 1000 jobs the fish farm investment required is $ 2.2 million with an annual production of 3 million pounds of fish.

And elsewhere on the CH site,

> “Twelve gifts of $100 will put one new cage in operation. $300 will put a child in school. $2,200 will purchase 2 cages and instantly create one job. $120,000 provide 50 quality jobs that will sustain one village.”

In the meantime, Clinton stayed true, remarking sometime between 2012 and 2014,

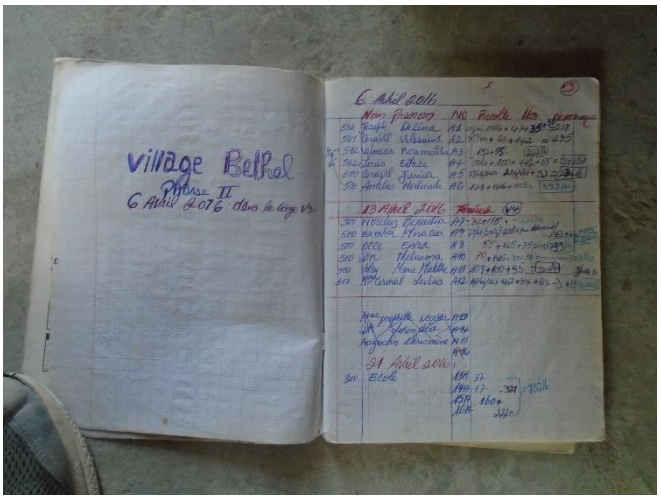
> ”I was there, I saw families of eight living in one room with hardly any roof at all. [Val] changed all that. It’s an exciting program, it really is. Given enough time and support, Valentin Abe really could feed the whole country.”
>
> — Bill Clinton (quoted in The World We Want Foundation Annual Report 2014, page 3)

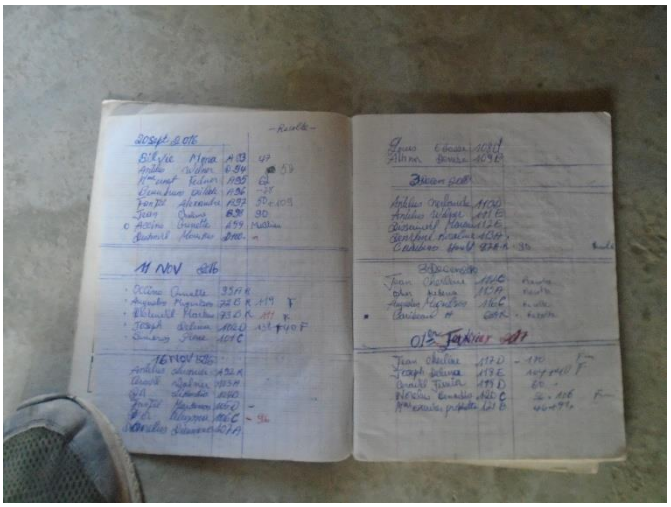
Appendix 2:

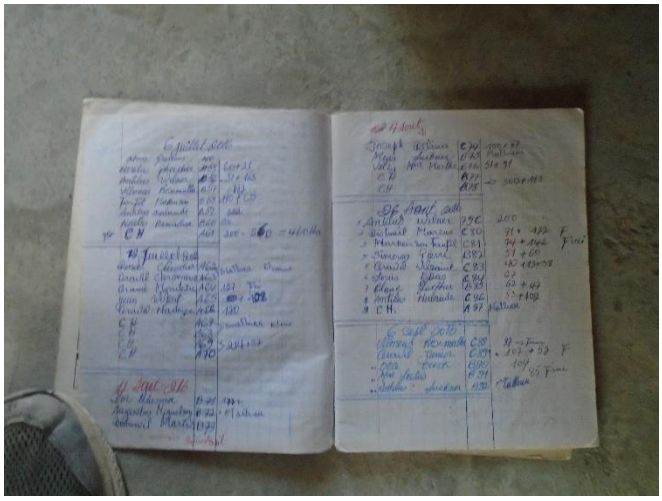
Caribbean Harvest Beneficiary and Harvest Records

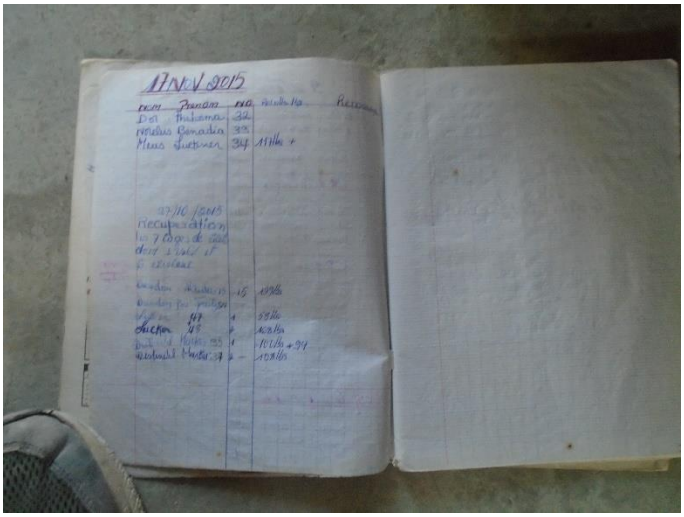
August 2015 to June 2017

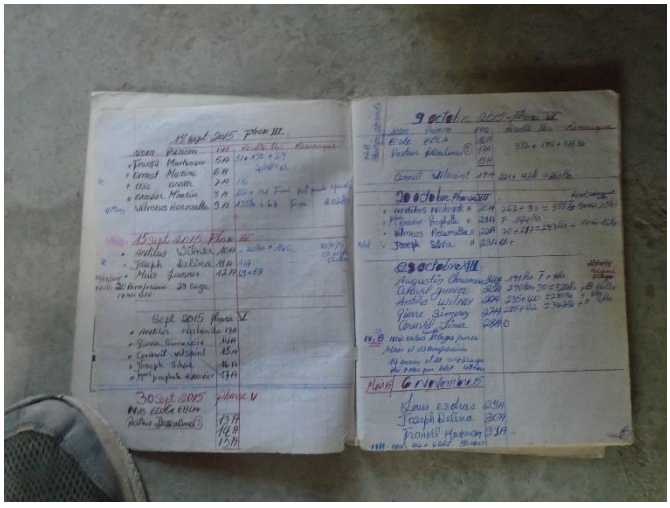
(23 months)

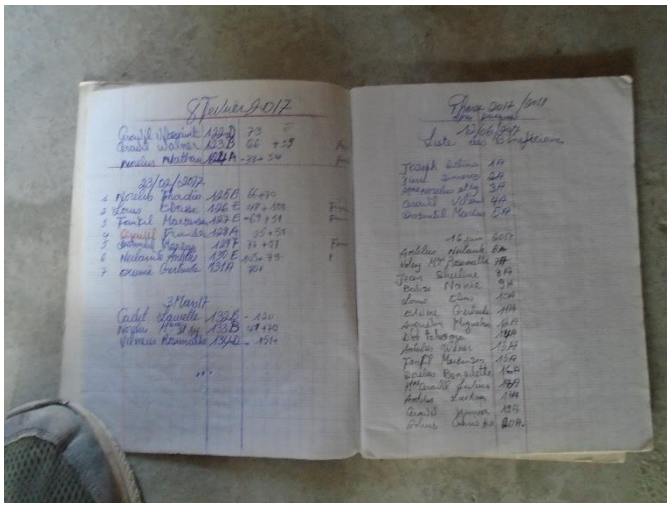












D. Institutional and Expert Contacts

Institutions visited

Providence University
Complexe Educatif Men Nan Men project in Ganthier
Foi et Joie
Love-a-Child
L'Eau de Vie
Christ pour Tous
CAD Orphanage
Taino Aquaculture Ferme
Operation Blessing Fish Hatchery
Operation Blessing School
Christian Ville
Double Harvest

D'Leau Lavi Hospital,
Keith Ian Martin, Ifm.hdr2@gmail.com

Fishing Association in Pelgre
Sejour Jean Robert, <sejourjeanrobert@yahoo.fr>
Bolibry, bolibry@yahoo.fr

Taino Aqua Ferme
Founder and CEO, Hans Woolley, hwoolley@gmail.com

Melkicedeck Faubert, Deputy General Manager, Cedeckbird@yahoo.fr

The World We Want Foundation
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Caribbean Harvest
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Agronomist Alexandra, Alexandramariedanielnoel@yahoo.fr

Agronomist Bernadin Luxis, BernadinLuxis@yahoo.fr

Agronomist Jacob Lemond (resident Agronomist at Betel), Lemondjacob157@gmail.com

School Director, Pastor Dessalines, Ddessalines3@yahoo.fr

HOTES Foundation
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Love-a-Child
Sherry Burnette, shar@lachaiti.org

E. NOTES

[i] For fish-farming in Haiti prior to 1971, see

Lovell, R.T. and D.D. Moss. 1971 Aquaculture Survey Report for Haiti International Center for Aquaculture and Fisheries and Allied Aquacultures. Auburn University, Alabama.

For fish-farming in Haiti from 1971 to 2005, see

Chounoune, F. Jackson. 1998 Fish Culture Projects. Bulletin vol 11 n°1 Some fisheries and aquaculture projects in Haiti. International Center for Aquaculture Auburn University Agricultural

Hargreaves, John A. 2012. Developing Tilapia Aquaculture In Haiti: Opportunities, Constraints, And Action Items Proceedings Of A Workshop Sponsored By Novus International, Aquaculture Without Frontiers, The World Aquaculture Society, And The Marine Biological Laboratory Edited. Aquaculture Assessments LLC

Landell Mills. 2012 Final technical report STRATEGIC ASSESSMENT OF AQUACULTURE POTENTIAL IN HAITI, 2012 Project Ref. Number: N° CAR/3.1/B12 Region: Caribbean Country: Haiti October 2012 Project implemented by: Landell Mills "Strengthening Fisheries Management in ACP Countries

MARNDR 2010. Programme National pour le Développement de L'Aquaculture en Haïti 2010-2014.

[ii] See Clinton Foudnation, https://stories.clintonfoundation.org/fish-farms-fighting-poverty-in-haitis-rural-communities-8dae22aece20

[iii] Clinton's firm belief that Valentin Abe's model worked is a little hard to understand in retrospect, especially in view of the findings in this and other evaluations of CH. Nevertheless, the former president of the US, with no evidence to support his conviction, reputedly said things like,

> "I was there, I saw families of eight living in one room with hardly any roof at all. [Val] changed all that. It's an exciting program, it really is. Given enough time and support, Valentin Abe really could feed the whole country." — Bill Clinton
>
> (quoted in The World We Want Foundation Annual Report 2014, page 3)

[iv] According to LEVE, the first $250,000 grant to Caribbean Harvest was *not* an In-Kind grant but rather a standard cost reimbursement with the funds paying for:

1. Purchase of cages
2. Solar panels
3. Installation (metal support for solar panels; connexion)
4. Transportation

LEVE covered purchasing and installation for 67 KW of solar panels which gave a quantity of: 300 solar panels and Caribbean Harvest had 70KW previously installed

LEVE provided materials to construct 320 small cages, they built 257 small cages and the remaining materials is in stock to build the 63 small cages remaining for an amount of USD 115,170.61. Caribbean Harvest did not buy small cages.

LEVE did not cover big cages. Caribbean Harvest has bought 11 big cages, 7 big cages are operational and 4 are not operational yet.

Caribbean Harvest has contributed to the purchase of Equipment for an amount of $294,500 USD and for some renovation and rehabilitation of their office for $60,000USD

LEVE approved expenditures:

Cages	$ 150,000.00
Solar Panels	$ 75,000.00
Metal Support	$ 18,000.00
Wiring	$ 4,000.00
Transport	$ 3,000.00
Totals	$ 250,000.00

Realignment and the final spending:

Cages	$ 115,170.61
Solar Panels	$ 113,288.19
Metal Support	$ 12,910.54
Wiring	$ 3,461.08
Transport	$ 5,169.58
Totals	$ 250,000.00

2. An additional grant of $50,000 was paid on 5 milestones for an amount of (10,000.00 each). For the dispersal of each payment, CH would have needed to provide each time a list of 5 new distributors to receive the payment. The money received would help them buy a "camion frigoriphique". This information is not written because LEVE cannot buy vehicles for clients. Thus, this support was part of a "challenge grant."

[v] As defined in USAID 2017.Enumerator Guidance: Full Model. A Guide For Implementing A Resilience Module, p. 2. Specifically,

> Absorptive capacity: the ability to minimize exposure to shocks and stresses through preventative measures and appropriate coping strategies to avoid permanent, negative impacts.
>
> Adaptive capacity: making proactive and informed choices about alternative livelihood strategies based on an understanding of changing conditions.
>
> Transformative capacity: the governance mechanisms, policies/regulations, infrastructure, community networks, and formal and informal social protection mechanisms that constitute the enabling environment for systemic change.

[vi] Regarding the project being self-sustaining: In the words of Valentin himself,

"We talk to partners that can provide the seed capital for those families. And then, after the initial investment, those families can take care of themselves." (Clinton Foundation 2010).

[vii] Examples of claims that the model was already proven successful,

Since the process is well proven Caribbean Harvest through Prosperity Aquaculture can create jobs essentially as fast as it receives funding….

Social Enterprise Fund (2011)
http://www.socialenterprisefund.org/haiti_fish_proj_13.html

His [Valentin Abe] recent Haiti work (2005-2010) "confirmed the technology practiced in the Auburn Aquacultural Laboratories."

Caribbean Harvest Website
https://www.caribbeanharvestfoundation.org/about-dr-abe.php

"This is the biggest return on an investment under $1 million for people to chart their own course in life that I have yet seen."

Clinton Foundation, Fish Farms: Fighting Poverty in Haiti's Rural Communities

https://stories.clintonfoundation.org/fish-farms-fighting-poverty-in-haitis-rural-communities-8dae22aece20

Unlike traditional philanthropic models, a donation to Fish4Life is an investment that fuels the sustainable, ongoing income of individual families [sic]. The financial return is substantial: an upfront $2,684 capital investment in a fish farm yields an 85% return on the investment by generating annual recurring income of $2,300. This is substantial, representing 3.5x the average income in Haiti.

Fish4Life/Michael Peterson Foundation
https://www.fish4life.org/the-impact/

[viii] Examples of High expectations for growth:

With fingerlings from Caribbean Harvest's new hatchery and cages from Heifer International, it was expected that about 2,000 cages would be present in Lake Peligre by 2015, translating to well over 1,000 jobs being created, according to Caribbean Harvest's website as of September 2016.

Engineering Aquaculture in Rural Haiti: A Case Study

International Journal for Service Learning in Engineering, Humanitarian Engineering and Social Entrepreneurship Vol. 12, No. 2, pp. 15-33, Fall 2017 ISSN 1555-9033

"Caribbean Harvest is attempting to expand very rapidly and reach an annual production rate of 2 million pounds of tilapia by the end of 2012 with good jobs for over 450 people."

Caribbean Harvest Website
https://www.caribbeanharvestfoundation.org/about-dr-abe.php

"This site **(Betel) will be the most important production site** of our program with **at least 260 cages** [sic] in the area." Caribbean Harvest 2013 Annual Report

"For 1000 jobs the fish farm investment required is $ 2.2 million with an annual production of 3 million pounds of fish."

Social Enterprise Fund (2011)
http://www.socialenterprisefund.org/haiti_fish_proj_13.html

"The goal that we have, to produce over 11 million pounds of fish, within the next five years, is reachable. We can do it. We have the technology. And if the money is available, then there is nothing that can actually hold [stop] us."

Abe Valentin, 2010
Clinton Foundation. Fish Farms Fight Poverty in Haiti's Rural Communities. Video. Youtube.com. Published on Dec 13, 2010

"In 2012, the Caribbean Harvest Foundation (CHF) committed to expand its model of intensive growth cage farming to create jobs, improve nutrition, and reduce poverty to three new areas in Haiti. CHF will set up 600 small farmers around Lake Azuei, Lake Peligre, and Lake Miragoane with training and sustainable employment opportunities through their tested fish culture model. In addition, CHF is building a processing plant, which will employ 66 women, to process, package, and store the fish produced. Moreover, CHF will utilize 30 percent of fish sale profits to support education, health, and nutrition initiatives for children in the communities where they operate. The education program will include construction of two new schools and provide 200 scholarships each year to impoverished children. CHF will also provide lunches to students in three schools and expects to reach 2,000 children over three years."

Clinton Global Initiative
Poverty Alleviation In Haiti: An Aquaculture Business Model
https://www.clintonfoundation.org/clinton-global-initiative/commitments/poverty-alleviation-haiti-aquaculture-business-model

[ix] Known Donations, i.e. from online claims, postings and articles.

Brinks Foundation	$250,000
Clinton Foundation/Global Initiative	$2,100,000
Clinton-Bush Foundation	$250,000
Operation Blessing	$50,000 +
Island Creek Oysters	$430,000

The World We Want Foundation	1,473,500
Fish4Life	$350,000
TNA	$250,000
Kellogg Foundation	$535,436
LEVE	$300,000
Social Enterprise Fund	$1,991,094
TOTAL	**$7,980,030+**

Known donors but unknow amount of donations
IDB
FAO
Oxfam
World Vision
Partners in Health
Food for the Poor
FAMVIN
Pou Timoun

[x]

"Car, mis à part les 200 personnes vivant essentiellement de Caribbean Harvest…"

Le Nouvelliste 2011

"Lake [Azuei] Production: Cages surpassed 300 and with fingerling production on track, we hope to hit the 500 cage mark by 2015,"

The World We Want Foundation
(whose director is also the director of the board for Caribbean)
2014 annual report

Caribbean Harvest is expanding its current successful operation in Lake Azeui (near Port-au-Prince) and is adding a 2nd charitable fish farming business on another 15,000 acre lake, Lake Peligre…

Thomson Smith, 2016, then Caribbean Harvest Chairman of the Board
https://www.linkedin.com/pulse/help-haiti-h-thompson-tom-smith/

[xi] Examples of reports high fish production include Caribbean Harvests 2014-2015 report in which they claim Caribbean Harvest products 1,500 lbs of fish per day. (The World We Want Foundation Annual Report 2017 Page 18)

[xii] Here is the incident reported that CH provided to LEVE after the theft and destruction of cages in Lilet.

CARIBBEAN HARVEST - REPORT ON INCIDENT OF MARCH 23rd 2016

Village of Lilet - Ganthier, Haiti-West

1. Introduction
At the beginning of the month of March 2016, Caribbean Harvest had 163 cages out of the 300 purchased
by the USAID/LEVE grant. Actual distribution of cages were Lilet (40), the Village of Bethel (57), both villages located near Lake Azuei (Commune of Ganthier) and 66 cages in Silguerre, Lake Peligre.
The village of Lilet has 67 families. It was originally planned to provide each family with two (2) which will would have accounted for the 134 cages of the total number of cages (300). Before providing cages to beneficiaries, Caribbean Harvest has an agreement in which beneficiaries are responsible for the security of cages. In no time has Caribbean Harvest provided private security to protect the cages.

2. Incidents and actions taken
Incidents in the village of Lilet started on Saturday March 19th 2016 where non identified individuals stole fish in 3 cages. The following Monday, the staff from Caribbean Harvest had a meeting with the village committee and the beneficiaries. Caribbean Harvest was assured the both the beneficiaries and the
committee will provide security as was agreed upon in the beginning. Caribbean Harvest did a quick inventory of the cages and estimated that fish in 26 cages were ready to be harvested. A harvest was then
scheduled for the following Thursday. During the night (Wednesday to Thursday) around 2 AM, a group of individuals within the village, and Caribbean Harvest learnt later that some beneficiaries were involved, brought the 26 cages to shore and removed all the fish within.
In light of these, Caribbean Harvest took the following actions:

- All remaining cages in water were moved and assigned to near new beneficiaries in the nearby village of Bethel and beneficiaries were compensated.

- All empty cages were also moved to the village of Bethel and redistributed to new beneficiaries.
- Caribbean Harvest informed LEVE of the situation although a written report was not submitted at the time.

Submitted by: Valentin Abe, PhD. CEO

[xiii]

> "Five years after its founding [2011], Caribbean Harvest boasted an annual production capacity of 2.5 million tilapia fingerlings." (RTI 2017)

In The World We Want Foundation's Annual Report *2014* they report that

> "Production of Fingerlings: The Hatchery now has 100% solar power capacity and fingering production is back at 200,000 fingerlings/month"

In the LEVE/USAID April 2014 Value Chain Assessment from April 2014 (Page 10),

> "Caribbean Harvest has grown their operations to include two hatcheries, one in the Plateau Centrale and the other in Croix-des-Bouquets, producing some 250,000 fingerlings a month."

[xiv] Haiti seeks to rebuild, or just build, power grid. By TRENTON DANIEL. The Associated Press

[xv] H. Thompson (Tom) Smith. Chairman of the Board of Directors at Caribbean Harvest Foundation. Published on October 17, 2016

https://www.linkedin.com/pulse/help-haiti-h-thompson-tom-smith/

[xvi] Figure for the cost of the land for Betel comes from the current Chairman of the Board of Directors, also director of The World We Want Foundation

[xvii] Caribbean Harvest owns the land the houses were built on and hence owns the houses. The original intention, according to several beneficiaries interviewed and CH staff, was for beneficiaries to pay for the homes. That plan was modified such that the beneficiaries would be given the homes within 5 years of occupation. That has not yet happened nor is there any immediate plan to give title to the beneficiaries.