German Red Cross

CROIX-ROUGE HAITIENNE

Post Sandy Fishing Assessment for Grand Anse and Nippes

by

Research Group Socio-Digital SOCIO-DIG

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Any opinions or construed bias are to be attributed to the author and should not be interpreted to represent or reflect GRC, IFRC, or HRC policy.

ACRONYMS

EMMA	Emergency Marketing Map Analysis
FAD (DCP)	Fish Aggregating Device
GOH	Government of Haiti
GRC	German Red Cross
HRC	Haitian Red Cross
IFRC	International Federation of the Red Cross
LAD	Lobster Aggregating Device
MARNDR	Ministère de l'Agriculture, des Ressources Naturelles et du Développement Rural
RC	Red Cross
USAID	United States Agency for International Development

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Executive Summary

- This study responds to a tender from The German Red Cross (GRC) in partnership with the International Federation of the Red Cross, Red Crescent Societies (IFRC) and the Haitian Red Cross (HRC). The objective was to help inform post hurricane Sandy *Livelihoods*/*Food Security* interventions to fishing communities in the Departments of the Grand Anse and Nippes.

- One in twelve men in Haiti fish; at least 90% can be classified as artisanal fishing, meaning they are dependent on simple non-mechanized fishing technologies and local, scavenged or inexpensive imported materials. Artisanal fishermen are linked to an equal number of market women who also use simple technology in drying of fish and transporting them to local markets. The advantages of the artisanal fishing chain is that because members of fishing households typically include both fisherman and market woman it allows households to profit from as many as four points in the value added chain (sale, processing, transport, and resale). The chain also provides a much needed source of protein to inland populations. The disadvantage of artisanal fishing is that it focuses on the shallow coastal shelf, now so heavily exploited that Reef Check cited Haiti as having the world's most overfished reefs; in the past 30 years the number of artisanal fisherman in Haiti has increased 500 percent.

- Ten percent or less of Haitian fishermen use modern industrially-manufactured equipment to fish offshore: these include imported fiberglass boats, outboard motors, heavy duty monofilament line, lures, GPS devices, fish finders, and FADs (fish aggregating devices: platforms anchored to the bottom of the ocean floor at depths of 1,000 feet and that attract large offshore predator fish that fetch high prices on the urban market). The modern offshore fishermen are linked to male buyers who sell to restaurants in the city. The primary advantage to this production and market chain is much larger catches and higher sale prices. Drawbacks include high investment costs, dependency on imported technologies, poor local infrastructure for cold storage, poor transport infrastructure, distant and fickle urban markets that can be disrupted by economic, political or meteorological calamities, all of which make it fragile and susceptible to interference. Moreover, investment in the industry has come overwhelming from foreign aid agencies who have underwritten the costs of boats, motors, equipment, installation of FADs, cold storage and even access to the buyers. NGO use of male dominated fisherman associations has also initiated a process of supplanting women as the traditional processors and sellers of fish. In this way the new market chain not only mitigates against female involvement in the economy, it cuts impoverished households out of the processing, transport, and resale links of the market chain; and it redirects fish away from inland populations who need protein. Moreover, the precipitous decline in billfish that long line fisherman from industrial countries catch with the assistance of FADs (fish aggregating devices) has led to an outcry from conservationists and makes supporting the industry a politically unfavorable undertaking, especially for benevolent organizations such as the Red Crosses.

- Noteworthy in deciding where and how to intervene in the fishing production and marketing chain is the scarcity of capital: both the traditional fish market chain and the modern chain are underwritten by fishermen who give credit to vendors, i.e. they advance fish to the buyers and collect their pay after the fish have been sold.

- If the Red Crosses are going to continue to maintain a presence in the region, they should be aware that contrary to official reports from Haitian government, the overwhelming majority of households in fishing communities also farm, rear livestock, harvest fruit, manufacture charcoal, and trade in the vigorous regional rotating market system. Many also have petty specialty professions they intermittently engage in, including housing construction and maintenance, homeopathic medicine, and a wide variety of skills related to building and maintaining boats used in the vigorous local marine transport industry. This integrated array of income generating and food producing activities are organized around households and form a household safety net that has evolved and adapted to centuries of recurrent drought, hurricanes, and political and economic crisis. The resiliency of the strategies means that most households are able to survive long periods of time before they begin to feel the full brunt of crises. When crisis does strike they turn first to production of charcoal and they increase dependency on *viv*-- manioc, yanm, taro, and plantains--crops that can be preserved for long periods 'on the vine' and that also preserve for months after harvest and without processing. In the event of prolonged crisis, households begin to spend the capital used in marketing activities and they sell off livestock and trees preserved for lumber.

- Special note should be taken of the fact that one of the first cash expenses most households cut when confronted with prolonged crisis is school tuition and expenditures on school uniforms for children.

- When considering how to intervene, the Red Crosses should also take note of the uglier side of aid. Emergency aid interventions have sometimes impacted local livelihood strategies in negative ways. The impact that indiscriminant distribution of food aid has on the local production is one. Another is micro credit provided at absurdly usurious annual rates of 60 to 80 percent. With regard to fishing, an example of an inimical the NGO practice was seen above--and is worth repeating for emphasis: specifically that of giving to male dominated associations control over fish storage facilities and the contacts for them to sell fish to urban buyers thereby supplanting women in what has traditionally been a female dominated processing and supply chain.

- With the preceding points in mind the recommendation for short term intervention is,

    - Aid to market women in the form of cash grants to women's VSLAs (Village Savings and Loan Associations). This would help empower women vis a vis the encroachment of the male fish intermediary who is invariably from the ranks of wealthier men in the community; it would reinforce the integrated household livelihood strategies described above; and it would help women build their market capital, one of the main resources that households fall back on in time of crisis.

- A strategy recommended for future interventions is,

    - Developing a system for intervening at the level of school tuition during times of crisis, i.e. giving tuition vouchers to village children. This would offer the Red Crosses a mechanism for efficiently getting aid to needy households while doing no harm to the equilibrium of livelihood strategies and the market economy.

    - Another longer term option that should be vigorously pursued is the provision of ambulance boats to the more remote communities in the region, something that would help save lives in the frequent cases of accidents at sea, when foul weather strands artisanal fishermen, or in the cases of medical emergencies for transport to mainland hospitals

- Any longer term options that focus on fishing should consider conservation of marine resources, encouraging community regulation of resources, and introduction of technologies that reinforce organization, such as use of Lobster Aggregating Devices and community participation in the construction of artificial reefs.

- If considering interventions that target modern offshore fishing, the two most important options are,

    - Cold storage facilities placed under the control of VSLAs
    - Transport

Introduction

This study responds to a tender from The German Red Cross (GRC). The GRC is working in partnership with the International Federation of the Red Cross, Red Crescent Societies (IFRC) and the Haitian Red Cross (HRC) to decide how to best direct post hurricane Sandy *Livelihoods*/*Food Security* interventions to fishing communities in the Departments of the Grand Anse and Nippes. Tropical Storm Isaac in (August 24) and Hurricane Sandy (October 24) caused torrential rainfall and severe flooding in Haiti's department of the West, Nippes, South, Grand'Anse and South East, as well as in coastal areas of Artibonite and the Northwest. The two storms combined reportedly resulted in 78 deaths and 24 people missing. Around 33,500 people left their homes for temporary shelters (USAID 2013). The Government of Haiti reported 6,678 houses destroyed, 24,617 damaged and 9,352 flooded. Most damage occurred in the Grand'Anse, Nippes, Sud, Ouest and Sud-Est departments (see The Guardian 2012). Total cost of damages were estimated to be in excess of US$242 million.

Among other relief efforts, the German Red Cross will deliver recovery assistance to restore and protect the livelihoods of 500 affected fishing-dependent households in the Departments of the Grand Anse and Nippes. Target beneficiaries are the ultra-poor and poor with resources also channeled through coastal civil society organizations (fisherman associations; women's groups; and business associations). Specific 'best bet' interventions will be selected on the basis of the findings in this report. Task of the consultancy included:

1) Selecting the most critical market systems or coastal fishery products to study using various specific criteria.
2) Identifying the key analytical questions to guide the investigation of the market system.
3) Producing a detailed emergency marking mapping and analysis (EMMA) of the coastal fisheries sector.
4) Identifying gaps and opportunities available to actors of the chain
5) Making recommendations for interventions.

To accomplish these tasks the consultant carried out archival research and joined a team of Red Cross volunteers in visits to 8 communities in the region where we held 'town hall' type meetings and focus groups. The analysis was based on a strategy called EMMA, discussed below.

Methodology: Emergency Market Map Analysis (EMMA)

The GRC tender for this study called for an Emergency Market Map Analysis (EMMA), a decision making strategy that early responders use in the wake of disasters such as earthquakes and hurricanes. First developed by Lili Mohiddin and Mike Albu (2008) for Oxfam, the EMMA strategy involves gathering data on specific market chains and then graphically illustrating each link, evaluating the impact on critical sectors of the chain, and identifying the most appropriate points of intervention to aid in recovery. The process is divided into three components:[i]

- Market mapping and analysis: The creation of the visual map of the market chain
- Gap analysis: Defining household deficits before versus after disaster
- Response analysis: Determining what are the most appropriate points of intervention for relief organizations such as the GRC

The UN, major NGOs, and governmental organizations worldwide are giving the EMMA technique a special role in early disaster response. For this reason we should be especially vigilant, critical and self-reflective regarding the EMMA – and any other post disaster guidance tool – so that we can maximize the positive impact of our interventions and avoid prolonging or aggravating post-disaster economic fallout. In the endeavor to improve technique and better target future interventions, we should take prior EMMA shortcomings into consideration. An example of some potential shortcomings that have received little to no attention came in EMMA applications during the post-earthquake Haiti relief effort.[ii]

Teams of first responder EMMA experts working in Haiti in the months after the 2010 earthquake reported income for semi-skilled and skilled construction workers at five to seven times the going rate;[iii] they identified what are male owned gardens as "female-owned,"[iv] in analyzing wood for building construction they put little emphasis on the local timber market but instead emphasized more expensive and less important international market chains.[v] Errors such as these can have a very real impact on the entire recovery phase. The EMMAs were an enduring decision-making platform for the International Rescue Committee, American Red Cross, Haitian Red Cross, and International Federation of the Red Cross, Save the Children, Mercy Corps, Oxfam GB, ACDI/VOCA, World Food Program and FEWS/NET.

Another example of a significant shortcoming with regard to post-earthquake Haiti EMMAs is Gap analysis conducted in Jacmel. Reliance on reports from interviews led an EMMA expert unfamiliar with Jacmel and Haiti before the earthquake and who relied on information from locals keenly interested in obtaining as much aid as possible concluded that people in Jacmel suffered a 20% to 50% drop in income and a 10% to 50% drop in expenditures. A simultaneous study (Schwartz 2011) pointed to the impracticality of obtaining reliable income data, and cited the massive influx of remittances, aid expenditures and relief supplies, and the tens of thousands of refugees in the area, and the aid workers themselves – all of whom gave a massive economic stimulus in the form of increased transportation services, phone card sales, use of porters, and expenditures on everything from meals to rum and prostitutes – to argue that Jacmel was experiencing an economic boon on par with its annual carnival. Nevertheless, the conclusion that deficits were occurring conformed to the expectations of most newly arrived aid workers, jacking up demand for increased aid from locals, government officials, grassroots organizations, and the NGOs and UN agencies.[vi]

In summary, EMMA is an intuitively useful and easy to apply tool, but in the hands of people who have little understanding of the local culture or economy, or who are seeking to corroborate specific expectations, it invites problems that we should recognize and develop techniques to avoid. Specifically, the source of errors can be expected from:

- Formal sector business interests (likely the source of the inflated salaries in the post-earthquake construction EMMA seen above)

- aid practitioners pressured to conform to politically correct Western NGO, UN, and activist mandates (as noble at it may be to promote aid to women, the likely reason for the identification of women, not men, as owners of bean gardens seen above)

- Avoidance of stigmatized environmentally or politically incorrect industries (the likely reason for overlooking the vigorous Haitian trade in local timber seen above)

- the skewing of results – intentionally or otherwise – to make a situation appear worse than it is and thereby encourage increased aid from donors (the likely reason why the boon in the Jacmel economy was ignored in favor of demonstrating Gap deficits rather than surpluses).

Not discussed but evident in the analysis presented in this report are that EMMA is prone to lead researchers to overlook local materials that can be market substitutes; to overlook the significance of overlapping livelihood strategies; and to overlook that although countries like Haiti are poor and in ecological crisis, local culture is often adapted to centuries of recurrent crises with its own mechanisms for coping with disaster, mechanisms that responsible emergency intervention specialists should try to identify and reinforce or, at the least, not disrupt and in doing so cause more post-disaster confusion, chaos or setbacks in economic recovery.[vii]

A final critique of EMMA is the Gap analysis. Gap analysis seeks to evaluate the difference in income before versus after a crisis. But many people in developing countries, particularly Haiti and particularly rural Haiti, do not think nor operate along the same continuum as developed world salary earners. The poorest of the poor in Haiti are indeed the rural populations (see Sletten and Egset's (2004)). But as will be seen in greater detail shortly, they are adapted to crisis. During good times, they tend not to increase spending on food but rather invest in land, crops, and livestock, fishing traps, nets and boats. They buy individual trees and build up the marketing capital used in trading. When crisis hits, they begin a slow sell off of their goods and livestock and they begin to spend the capital used for trade. So the "gap" is not in income but in ownership. And actually finding out what people own is extremely difficult. There is a large anthropological literature on the jealousy, suspicion, and superstitious secretiveness with which peasants the world over regard their possessions and investments.

Haiti is no exception, if not an extreme. They would like for their neighbors to not even know what they own. Woe to those who blab to outsiders. All of which adds up to the fact that accurately estimating a "gap" in income is a near impossible task in communities such as those of the Grand Anse. Moreover, there may not even be a gap. A sell off of goods, harvest of charcoal and preparation for what peasants may expect to be a prolonged crisis could mean elevated income. Thus, the issue is not or should not be income. We know there has been a disaster. We know that people's livelihoods have been impacted. We can assume that income has or will decline. And so a better use of our time and resources is to simply focus on exactly what livelihood strategies and market chains were impacted.

With all these points in mind and the fact that the crisis assessed in this study occurred almost a full year ago (EMMA is designed to be conducted in the six weeks following a disaster), we modified the EMMA research strategy to focus on:

- The overall material infrastructure and technology chain involved in fishing

- Processing, storage, transport, and marketing chain involved in getting the fish to buyers

- The integrated livelihood strategies that fishing household also depend on to survive, specifically those mentioned in the introduction above: marketing, livestock rearing, charcoal manufacturing and commerce

The logic of including other livelihood strategies – and a principal shortcoming of the EMMA – is that economies and market systems are not composed of isolated micro-cells but rather are more effectively conceptualized as part of integrated systems that influence one another. These points are especially poignant in the case of Haiti, a country that has a long history of relative isolation and a vigorous and highly integrated internal marketing system adapted to economic, environmental, and political crises.

Field and Archival Research

The consultant briefed four GRC staff members; we then divided into two groups and visited 8 fishing communities in the region: The consultant's team visited Anse Macon on the island of Cayemite, the communities of Obo, and Grandanz on the coast, Grand-Boucan on the peninsula east of Cayemite, and Petite Trou on the mainland. The second team visited five communities in Grand Anse: Abricots, Anse Hainault, Roseaux, and Corail. Facilitated by the Red Cross societies regional network of community animators, we held community meetings that ranged in size from 53 in the hamlet of Grandanz to over 250 on the island of Caymite. In each community we also conducted focus groups with from 5 to 12 fishermen. Fishermen A review of government and NGO reports listed in the bibliography informed the field research and the observations, conclusions, and the livelihood and marketing maps presented in this report.

Fishing

Fishing in Haiti

As the Western third of the Caribbean's second largest island, Haiti has a relatively small continental shelf surface area of 5,860 km^2, approximately 20% the size of the entire country (27,750); but it has an exclusive economic zone (EEZ) of mostly deep-sea that is 86,398 km^2, three times the country's landmass and including what could be one of the hemisphere's major offshore fisheries (FAO, 2005; Advameg 2013). Yet, Haiti's fishing industry is by contemporary standards based on simple and ancient

Figure 1: Haiti's Exclusive Economic Zone (PEM 2013)

techniques to an anthropologically fascinating extreme. As if looking back centuries if not millennia in time, fisher folk in Haiti are almost entirely focused on exploiting the limited shelf. The technology they use in this endeavor mostly rudimentary, artisanal strategies that yield small catches.

Of the some 26,000 fishing vessels that ply Haiti's coast, only 1,200 are motor powered (MARNDR 2009). The majority are comprised of 14,000 dugout canoes and another 10,000 handcrafted wooden dories, all powered either by paddle or sail. The fishermen who occupy these vessels use technology that differs little from pre-Columbian fishing strategies: hooks, lines, bamboo traps, and fishing spears. Ambulant market women are the primary purchasers of the fish. They gut, clean, and dry the fish and then haul them by foot, on pack animal, motorcycle, in boat, or bus to inland markets. In total an estimated 52,000 men fish, while 20,000 women process and sell the fish. That is only about 12% of Haiti's adult population, but the entire population benefits from an affordable and storable source of protein. For the some 3,000 to 5,000 fisherman who use modern industrial deep-sea fishing gear and who are oriented toward the high end urban market, there are 1,600 purchasers in the fishing communities linked to some 100 urban based fishing purchasing agencies, supermarket and restaurants.

Fishing in the Department of Nippes and the Grand Anse

Although petty in terms of international standards, fishing represents a significant part of the household livelihood strategy for some 250,000 men, women and children in Haiti, approximately 50,000 of who are located in the Grand Anse and Nippes (MARNDR 2009). The people who live in the fishing communities tend to be among the least educated people in the region and live in marginalized and remote communities. An estimated 92% have not finished high school – compared to 75% nationally (CRFM 2010; EMMUS 2012). Most of the communities visited in the course of the research could only be reached by boat or foot paths. Cayemite is an island with no motorized transport. Gran-Boucan is located on a peninsula also without road access. The communities of Grandanz and Oba are located in the midst of a swamp, with no roads linking either village to other communities or urban trade centers. The fishing and marketing strategies that people in these communities practice are overwhelmingly simple, based primarily on technologies for which raw materials are procured and manufactured locally.

A small minority of the fisher folk in these communities are involved in what we call “industrial fishing strategies.” The reader should take note that this is distinct from the modern fisheries using megaton steel ships and massive nets with hydraulic powered wenches and onboard machine powered cold storage. Our use of “industrial” refers to fiber-glass launches approximately 20 feet in length, open, but with outboard motors; long-line fishing gear; and monofilament nets. Nevertheless, while simple in comparison to the developed world version of modern industrial fishing fleets, the modern Haitian fishing and marketing system versus the artisanal system seen above are significantly different in terms of dependency on outside sources of materials and technology, fishing strategies, investment, returns, market chains, income and the impact they have on the environment as well as the lives of the people involved. In the pages that follow we describe, explain and analyze fishing in terms of the traditional artisanal versus the modern industrial production and marketing strategies.

Table: 1 Political Districts Department of the Grand Anse (area: 1,871 km²; pop 425,878 (est. 2009)			
	Arrondissement		
	Anse-d'Ainault	Corail	Jérémie
Commune	Anse-d'Ainault Dame-Marie Les Irois	Corail Roseaux Beaumont Pestel	Jérémie Abricots Trou-Bonbon Moron Chambellan

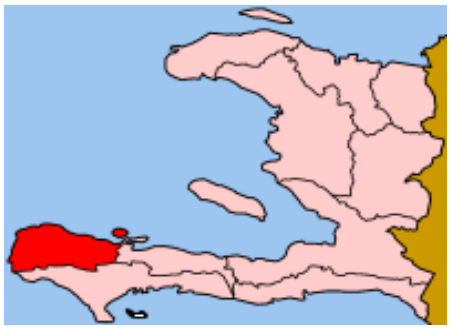
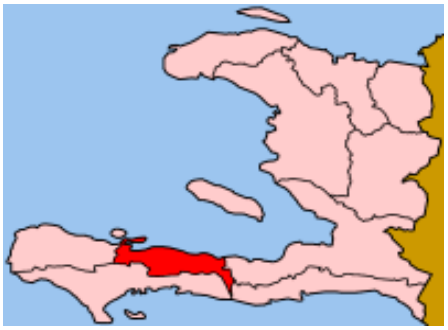


Table: 2 Political Districts Department of Nippes (area: 1,219 km²; pop 311,487 (est. 2009)			
	Arrondissement		
	Miragoane	Anse-à-Veau	Barraderes
Commune	Miragoâne Petite-Rivière Fonds-des-Nègre Paillant	L'Asile Petit-Trou Plaisance-du-Sud Arnaud	Barradères Grand Boucan



Artisanal Fishing

Figure 2: Artisnal fishermen in canoe raising a locally made net: Note the "industrial" compressor

Ninety percent or more of all fishermen in the region depend on traditional artisanal fishing strategies that exploit the shallow shelf close to shore (MARDNR 2009). In doing so they employ strategies almost identical to those Taino Indians were using when Columbus arrived five centuries past: specifically, seining (actively surrounding or driving fish into nets), setting traps and weirs, line fishing, spearfishing and free diving for lobster and conch. Most of the materials used have changed little as well. They are either foraged from local flora, scavenged from industrial refuse, or they are inexpensive and easily acquired imports. Contemporary fisherman in the region use paddles and canoes hewn from local trees (*canoe* is in fact a Taino word); traps crafted from bamboo; inexpensive *polyethylene* rope or those made from sisal or from scavenged and shredded feed sacks (*polypropylene*); weights of stone or lead scavenged from used car batteries; floats of discarded flop flops, plastic containers, and light wood; and nets of imported rolls of nylon string but woven locally. The few items in the artisanal tool kit that are entirely

imported are cheap imported monofilament and metal hooks for line fishing, and masks and fins for spearfishing and gathering conch. Even most snorkels are crafted from scraps of PVC, and spear guns from a length of PVC for the stock of the gun, braided strips of inner tubes for an elastic charging band, and a scrap length of sharpened steel for a spear. Processing and storage is largely the same as pre-Columbian techniques: specifically, cleaning, salting and sun drying. Transport to markets is more often accomplished on foot or pack animal, by sail boat, public bus or truck. Administrative technology is simple as well. The artisanal fishers and female market women who sell the fish have little interest in organizational structures beyond their own household labor pool and local seining teams: no associations or cooperatives. Those organizations that do exist are almost entirely responses to NGO initiatives and connected to offerings of resources: specifically free boats, nets, and improved storage facilities in the case of the men; promises of cash and credit in the case of the market women.

Figure 3: A locally made fish trap

Table 3: Contemporary Artisanal Fishing in Haiti vs. Pre-Columbian Taino Indians		
	Materials	
Technology	Contemporary Haitian	Pre-Colombian Taino
Canoes	Local tree trunks	Local tree trunks
Paddles	Local wood	Local wood
Fishing line	Industrial filaments (nylon, Fluorocarbon, Dacron...)	Sisal, pineapple, cotton
String for nets	Nylon, sisal	Sisal, pineapple, cotton
Ropes	Nylon, sisal, shredded food aid sacks (polypropylene), vines	Sisal, pineapple, cotton, vines, tree fiber
Weights	Lead scavenged from batteries, Stones	Stones
Floats	Discarded flip flops, flotsam, Seed pods, wood	Seed pods, light woods, gourdes
Hooks	Metal	Turtle shell, fish bones, hard wood,
Spears/guns	Wood and reed harpoons, atlatls, bows, arrows bow	PCV, scrap metal rebar, woven inner tube, imported industrial made spear guns
Weirs	Palm, maguey, maranta, native bamboo	Palm, maguey, maranta, bamboo
Traps	Palm, maguey, maranta, native bamboo	bamboo

Industrial Fishing

Modern industrial fishing technologies are evident to varying degrees in all fishing communities in the region. The fishing technologies include fiberglass boats and outboard motors that permit offshore capture of larger fish that that are in greater demand in the high end urban market; imported monofilament nets that more effectively snare fish; air compressors for deeper and more intensive spearfishing and gathering conch; and offshore floating platforms called "Fish Aggregating Devices" (FADs) that attract large fish making the location and capture of the fish vastly easier and more efficient. New processing and storage technologies include ice, coolers, electric freezers, and cold storage rooms for preservation, motor boats for rapid and safer transport both to offshore fishing grounds and to the urban market. All of this seems intuitively advantageous to everyone involved: fishermen, marketers, buyers and the regional economy. But, as will be seen, it may be that conditions in Haiti make the endeavor costly, risky, and economically unsustainable in the absence of major investments from the international community.

Table 4: Fishing Strategies, Artisanal vs. Industrial

Technology	Materials	
	Artisanal	**Industrial**
Transport	Dugout canoes, wood paddle, plastic and cloth sails	Launches (Fiberglass boats with 15 to 60 HP motors)
Fishing	Trot lines, line fishing, string nets, monofilament nets, seining, live bait, surrounding or driving fish into nets	Trolling, long-lining, monofilament nets, lures, DCPs, setting nets
Diving	Mask, fins, snorkel, spear gun	Mask, fins, compressor, spear gun
Storage	Salt, lime and sundried	Ice, cold storage

The modernization of fishing is linked, if not dependent on, the formation of associations and cooperatives. These organizations tend to be dominated by traditional elites, politicians, and urban oriented entrepreneurs (see Weiner 2005 for example); they are heavily subsidized with funds from the international community; and to date, they include only a small minority of the total fishing population. It is nevertheless an area that shows promise. The impact is best exemplified by success in Grand Anse communities of d'Anse d'Hainault, de Dame Marie et des Irois Anse. In 2000 the European Union and MARNDR supported the formation of two local associations, provided access to fishing gear and cold storage, and installed DCPs. By 2008, 68% of fisherman in the area had outboard motors; fulltime fishermen were earning an estimated US$29,700 per year (Guinette 2009; see Table).

Table 5: Anse Hainault (Guinette 2009)

	Per trip	Trips per year	Total per year
Full-time	95.50	311	$29,700
Half-time	52.41	182	$9,538
Part-time	127.52	26	$3,315

Pros and Cons of Artisanal vs. Industrial Fishing

Before launching into a detailed analysis of fishing and marketing strategies in the region, it is useful to examine the pros and cons of the two strategies, both with regard to the fisherman, the environment and, not least of all, the significance to international organizations of supporting one strategy versus the other. The point is especially poignant for GRC as decisions made regarding interventions must conform to local needs but also to the opinions and critiques of donors.

For the fishermen, industrial offshore fishing seems to have obvious advantages. Artisanal fishermen are limited in range. They lack outboard motors; their vessels are fragile and unfit for the open sea. They lack portable cold storage. This means the artisanal fisherman must stay close to shore. The size of fish he can catch is limited as well. Even when the artisanal fisherman manages to hook a large fish he is often unable to pull it aboard, as he may capsize in the process or get pulled out to sea trying to hold on to the fish.

Thus it seems evident that industrial deep-sea fishing is eminently more advantageous to fishermen. Moreover, a concern in terms of interventions that target artisanal fishermen is its ecological impact on the coastal shelf. In the past 30 years the number of artisanal fishermen exploiting the Haiti's shelf went from 11,000 in 1985 to 30,000 in 2001 to over 50,000 in 2010.[viii] It is a 5 fold increase. Coupled with the complete absence of any controls on fishing areas, size and age of the fish caught, and compounded by extreme erosion and consequent muddy runoff from streams and rivers that smothers reefs and destroys fish habitat, Haiti's shelf is said to be in a state of extreme ecological crisis. Reef Check, an international volunteer agency that has taken on the responsibility of monitoring the ecological status of reefs throughout the world, has identified Haiti as having, "the most overfished reefs in the world" (Reef Check 2001). [ix]

So again, the apparent ecological unsustainability of Haiti's current artisanal fishery seems to point the way toward offshore fishing. This means FADs, fiberglass boats, and access to high end urban markets. But for the GRC and international organizations sensitive to negative publicity and environmental crisis, there are problems here as well. First off, throughout the world, stocks of large offshore predatory fish have been declining precipitously now for at least the past 4 decades. Some studies indicate declines in Billfish-- the fish that Haiti's new fishermen aim to catch –have declined by 65 to 98 percent in the past 40 years (Chambers and Associates 2010). Questions have been raised in this context about the role of FADs. Greenpeace calls them "deadly fish magnets" that are driving deep sea fish beyond the point-of-no-return. Environmental activists are lobbying for quotas and prohibitions. Many people in the developed world are listening. Among them are surely many Red Cross donors.[x] [xi]

Another issue is the costs associated with offshore fishing and who has been paying them. Investment in the industrial fishing gear, boat and motor necessary for a single equipped vessel generally exceeds US$20,000. Cold storage is another cost. FADs are anchored, preferably with

chain, to the bottom of the sea at depths of 1,000 feet or more. Someone has to pay for all of this. Seafood imports from Haiti were long ago banned in both the US and Europe because phytosanitary concerns, which means that Haitian fishing attracts little corporate financial investment from outside the country (MARNDR 2009). The Haitian state makes no investments in fishing. It is unable on its own to accomplish the task and will remain that way for the foreseeable future. For a lucky few fishermen, costs have been subsidized by international aid organizations, as in the case of d'Anse d'Hainault, Dame Marie et Irois Anse communities seen above.

Figure 4: The artisanal fishing fleet in Wozo, all hand made locally bought, paid for and maintained by the fishermen

The point is that the industry is being financed with aid, to the extent that it is being funded at all. Anse d'Hainault region is an excellent example. The offshore industrial fishing industry began there in 2000 with EU financing: 132 outboard motors were sold on credit and subsidized at 50% of cost; 10 DCPs were installed; a credit fund was provided as well as cold storage facilities and materials. Fishermen responded. The number of offshore fishing vessels in the area went from 120 in 1997 to 220 in 2007 (Damais et al, 2007; (Guinette 2009). In 2008, Food for the Poor reportedly gave each of the three communities an additional 24-foot fiberglass boats with outboard engines, 100-quart coolers, safety equipment, global positioning system (GPS) fish finders and kerosene freezers to store catches.[xii]

Figure 5: Modern fishing fleet in Wozo, all imported supplies from the NGO "Food for the Poor"

The role that aid plays in initiating the formation of fishing associations is clear. When the EU first began financing Anse Hainault, there was no fishing association. L'Association des Jeunes d'Anse d'Hainault converted itself into « Pêche Anse d'Hainaut Irois », or PADI, becoming the major recipient of boats, motors and securing access to the DCPs. Two years later, in 2002, the AMPAH (Association des Marins Pêcheurs d'Anse d'Hainault) was formed as an offshoot and co-recipient of the funds. In 2013, short before this report was written, representatives of one of

these associations sought additional funding and subsidizing from the Red Cross (based on report from Red Cross field manager), highlighting the likelihood that without influx of aid to the fishermen, investments would not have been made in the first place. And without continued support, it's hard to see how the industry can be sustained. [xiii]

There is also the issue of the stability of access to urban markets. While Haiti imports 70% of the fish consumed in the country (see MARNDR 2009), there is still the difficulty of getting high quality local fish to the Port-au-Prince market. Contacts, entrepreneurs, investments in time, storage and transport has all been subsidized and expedited by overseas aid agencies and foreign donors.

To understand why Haitians themselves never invested in an industrial fishing sector, one has to turn – as we will shortly – to Haiti's poor infrastructure, precarious urban market, and tumultuous political landscape. But for the moment, the dependency on foreign aid to establish and sustain what could be a highly lucrative enterprise should give us pause. We should ask if the industry is now sustainable or will be in the foreseeable future. The ultimate question in this regard will be whether local associations, government and entrepreneurs will at some point assume the costs and responsibility for the system necessary to make it sustainable or if, as so often occurs with projects in Haiti, the industry will only endure as long as international donors subsidize it.

Indeed, it is noteworthy in this regard that while all along the coast one sees locally handcrafted canoes and dories with men working hard at artisanal fishing, there is a conspicuous absence of modern boats. In all of Haiti, less than 5% of fisherman can aptly be classified as industrial fisherman (MARNDR 2009; Guinette 2009). If the traveler goes ashore, in almost every fishing village in Haiti, he or she can collect the stories of failure and see the discarded and deteriorating hulls of fiberglass boats from past projects.

Table 6: Fishing Material Sources

Technology	Artisanal or Industrial	Cost	Locally manufactured	Source of Raw Material	Necessary for Artisanal Fishing
Fiberglass boat	I	$8,000		Import	
Motor	I	$2,500-5,000	✓	Import	
Monofilament net	I	$250 +		Import	
Gasoline	I	$5 per gallon		Import	
Sail plastic	A	-	-	Import	
Paddle	A	-	✓	Local	✓
String net	A	-	✓	Import	
Wood Dory	A	$300-1,000	✓	Local	✓
Canoe	A	$100 - 500	✓	Local	✓
Weights	IA		✓	Scavenge	✓
Floats	IA		✓	Scavenge	✓
Hooks	IA			Import	✓
Line	IA		✓	Import	✓
Traps	IA		✓	Local	

Analysis and Maps of Fishing Strategies

Summarizing to this point, as elsewhere along most of Haiti's coasts, fisher folk in the Grand Anse and Nippes remain dependent primarily on artisanal fishing strategies focused on exploiting the coastal shallows, traditional processing storage, and marketing strategies that differ little from pre-Columbian Taino Indian fishing technologies or those of the Buccaneer and colonial eras. Industrial fishing is a recent and promising phenomenon but dependent on heavy subsidization from the international community.

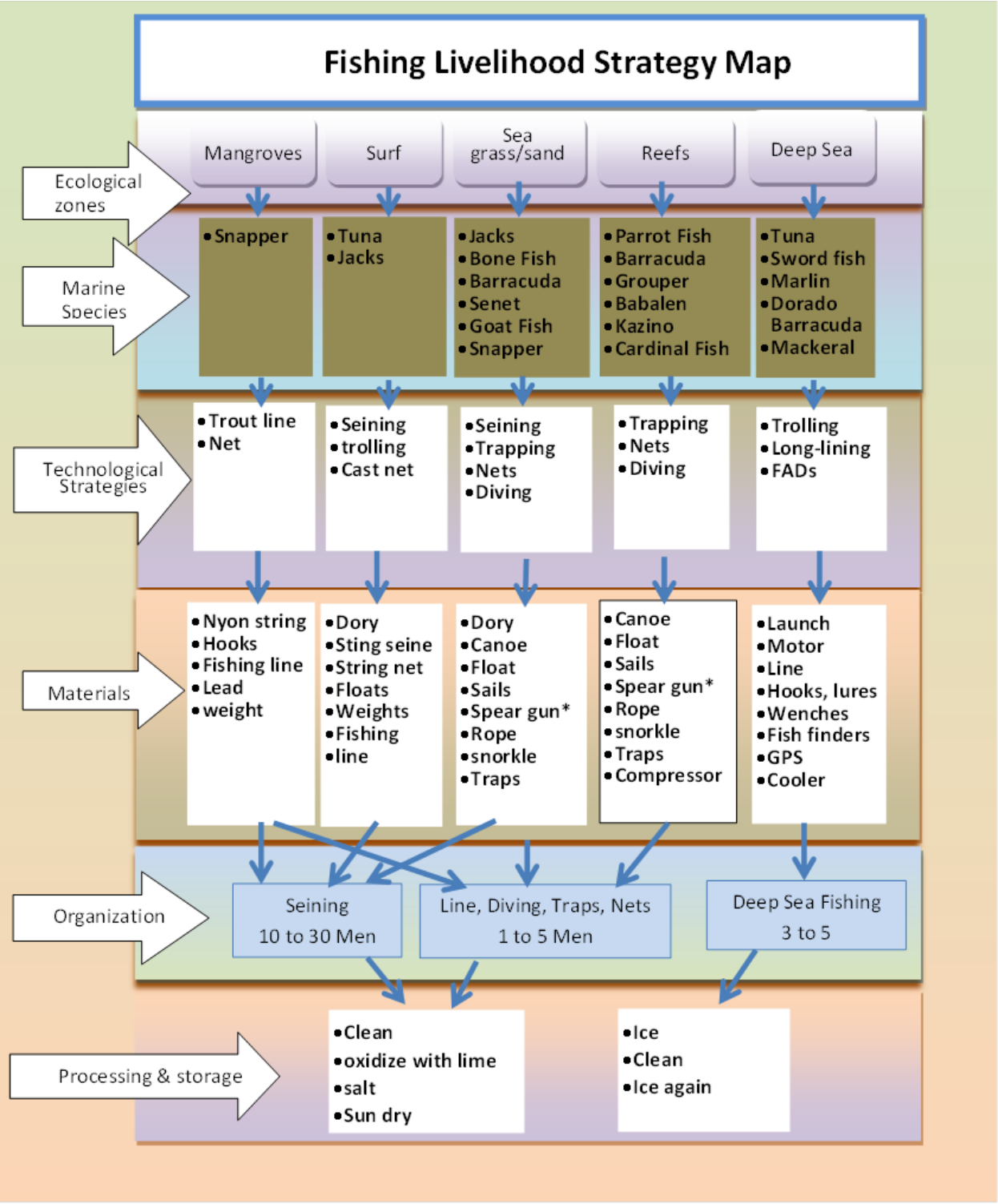
Our task now is to best understand how to effectively intervene during times of crisis to provide relief to fisher folk, particularly the poorest in the region. To accomplish this, we continue to take note of the natural divisions between artisanal fishing and the modern industrial fishing and marketing strategies. To graphically illustrate the systems we use as a basis the EMMA mapping strategy seen earlier. However, because of the critiques we made of the EMMA strategy – narrow focus on specific market chains, neglect of alternative local solutions, overlapping livelihoods, and the uselessness of trying to evaluate income differentials – we broaden the analysis to fishing livelihood strategies and processing-storage-transport-and-marketing patterns. We call our modified illustrations, Livelihood and Marketing Strategy Crisis Maps. Specifically we divided them into the following two systems:

- Infrastructural system: the ecological zones, fish species, materials and administrative technology of fishing

- Processing, storage, transport and marketing systems pertaining to fishing

(In the annex we provide a map and brief analysis of the overarching administrative and legal controls that govern and organize the fishing enterprise.)

Figure 6: Fishing Infrastructure



Understanding Significant Points Regarding the Livelihood Map

Ecological Zones

Fishermen in Nippes and the Grand Anse sometimes classify fish by where they are caught (they also classify them according to urban market value – see Wiener 2013. The significant difference between artisanal versus industrial fishermen is that the former are confined to the shallow and delimited shelf while industrial fishermen exploit the deep-sea of which, as seen, Haiti has a total area five times larger than the country itself.

Species

Artisanal fish caught year round are mostly juveniles or small, bony, fish not eaten on neighboring islands, and have low value on the international and urban market. Between June and January the more desirable migratory Skip Jacks, Sardines, and Bonito are caught, sometimes in great number. Industrial fisherman also harvest migratory fish, but their focus includes epipelagic fish, those large predatory fish that hunt the uppers levels of the deep sea – specifically Marlin, Swordfish, Dorado, Wahoo, Sailfish, Mackerel, Snapper and varies species of Tuna – and that have high value on the urban market.

Technological Strategies

Beyond the technologies detailed earlier and in the Livelihood map on the following page, the principal difference between the artisanal versus the industrial fishing strategies is their ability to access the deep sea and harvest large fish.

Materials

Artisanal fishermen operate largely independently off expensive and difficult to acquire imported industrial materials. Industrial fishermen, on the other hand, depend on it. The difference has consequences in the event of environmental, political or economic crisis. The artisanal fisherman needs almost nothing from abroad to go fishing and he sells his fish on the local market. The industrial fisherman cannot fish without access to overseas technology and he cannot sell his fish without access to the urban market.

Organization

Artisanal fishing is mostly an autonomous or single family enterprise that involves only one to three fishermen. It reaches its organizational zenith with the seine which is a team effort that requires major investments (a dory and seine), vigilance (looking out for schools of fish), timing (getting the team, boats and seine into the water before the fish escape), and coordination (putting the seine into the water, surrounding the fish, and then hauling them to shore or into the boat). Thus, the organization necessary to seine usually involves the met (the person who has invested in the seine and boat), a *kapten*

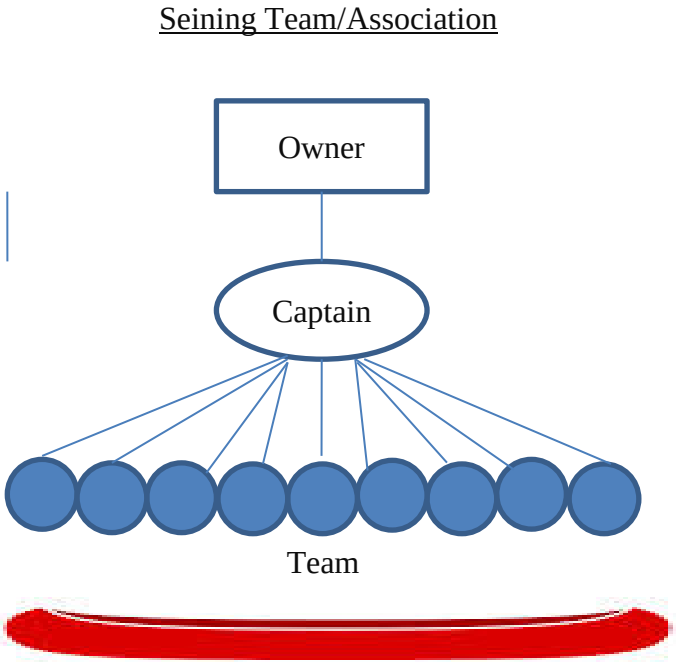


Figure 7: Diagram of Seining Team

Figure 8: A seine team that sees a school of Bonito

(captain who coordinates), and an *ekip* (a team of from 8 to 30 men). Emphasizing the significance of this natural organization, artisanal fishermen in Wozo – who like all fishermen in the region have a keen interest in trying to capture an international sponsor who will underwrite their transition into industrial fishing – explained that, "every seine is an association." Industrial fishing, on the other hand, depends on supply of materials, gasoline, installation of FADs, cold storage; elaborate, dependable and well-timed transport to urban areas; urban buyers who can receive, store, and sell the fish.

Discussion: Problems and Points of Intervention for Fishing Infrastructure

When we asked fishermen what they wanted in terms of infrastructural interventions, common responses included hooks, lines, nets, and canoes. There are good reasons that the Red Crosses cannot or at least should not comply.

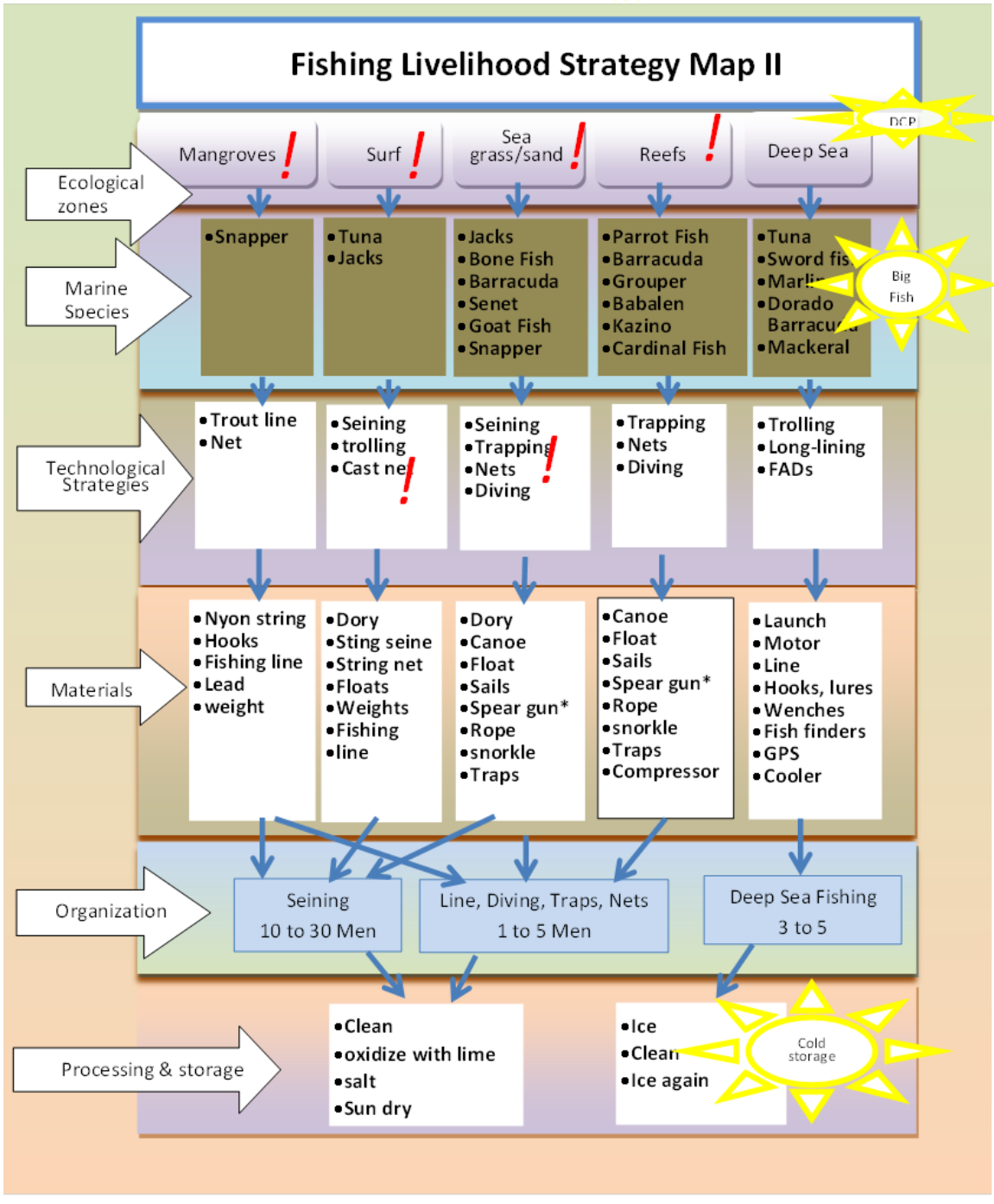
First, those who cannot obtain them cannot afford them. And this generally means that income from artisanal fishing for these individuals is insufficient. Put another way, they are lousy fisherman. They lack the skills and knowledge to maintain their livelihood. Indeed, the hallmark of artisanal fishing is that it is low investment, low, risk, low returns and resiliency in the face of disaster. If organizations such as the Red Cross need to step in and help artisanal fisherman recuperate from a storm then it may behoove us to first evaluate whether the fishermen could be better off doing something else. "It is better to teach a person to fish, than to give them fish," goes a popular biblical aid-worker slogan. The issue may be that there are no fish, at least not for the poorly skilled fisherman. On another level is the issue of, as seen earlier, the coastal shelf and reefs being already overfished. Supporting artisanal fishermen may be equated with helping them to completely wipe out fish stocks; whereupon there will not be any fish at all, no matter how skilled the fishermen.

There are answers: controls, regulation of catches, size and age of fish; preservation of breeding habitat; creation of artificial reefs; use of Lobster Aggregating Devices to limit the harvest of juveniles and pregnant females; and increased dependency on aquaculture. The Haitian Government Ministry MARNDR recognizes these options, but lacks the resources to respond. MARNDR has no boats and only 22 staff members with which to manage Haiti's 1,770 kilometers of coast and 52,000 fishermen (MARNDR 2009). Given the impact that neglecting Haiti's coastal resources will have on the Caribbean as a whole, massive interventions will come, eventually. Neighboring islands and the international community will at some point be forced to recognize it as necessary. The question then will be how bad did it get before we acted?

But for our purposes here, the point is that it would behoove the GRC to *not* intensify or encourage the current fishing strategies. What we can do within a humanitarian framework is give them lifesaving resources: most importantly ambulance/rescue boats (designated not- to-be-

used for fishing) and a system of VHF radios strategically located in communities. The urgency of the gesture cannot be overstated. In every community we visited, fishermen emphasized the need to reach hospitals or rescue fisherman or travelers. In Obas, a fisherman had recently been bitten by a shark and had to be rescued; in the hamlet of Grand Anse a woman died giving birth; in Grand Boukan three people drowned when a transport boat capsized; and in Cayemite a canoe capsized and three men had to swim through the night to reach shore. In each case a rescue boat could have averted or at least mitigated the emergency. The map on the following page summarizes the points of intervention and opportunity discussed above.

Figure 9:Fishing Infrastructure with Points of Intervention and Opportunity
(Key: ! = points of ecological crisis; ☼ = opportunity)



Purchasing, Processing, Storage, Transport and Market

Purchasers

As with infrastructure and fishing materials and strategies, there are two chains: the traditional one and a more modern one linked to the urban developed consumers. The *machann* (trader), who buys with an eye toward the domestic and popular markets, represents the traditional chain. The *achtè* (buyer), who buys with an eye toward the high end urban market, represents the modern link.

Figure 10: A "machann" with her dried fish

A ***machann*****,** almost always a woman, purchases, processes and sells fish. She buys the fish based on volume, not weight. She depends on labor from children, usually girls, and other female family members, to process the fish: specifically, gut, scrub with lime or sour oranges, heavily salt, and then sun-dry the fish on wooden racks. She may sell the cured fish to a sub-category of a *machann*, the *madam sara*,[1] or she may herself be a *madan sara.* A *madan sara* is an itinerate market woman and the country's primary accumulator, transporter, and redistributor of agricultural produce, small animals, crafts, and fish. After processing the fish or buying already salted and dried fish, the *madan sara* transports her product to a local regional market or to fulltime market in one of the principal cities, e.g. Jeremie, Miragoane, or Port-au-Prince. There she either sells them to local consumers or to another *madan sara.*

Figure 11: An "Achtè" weighing fish

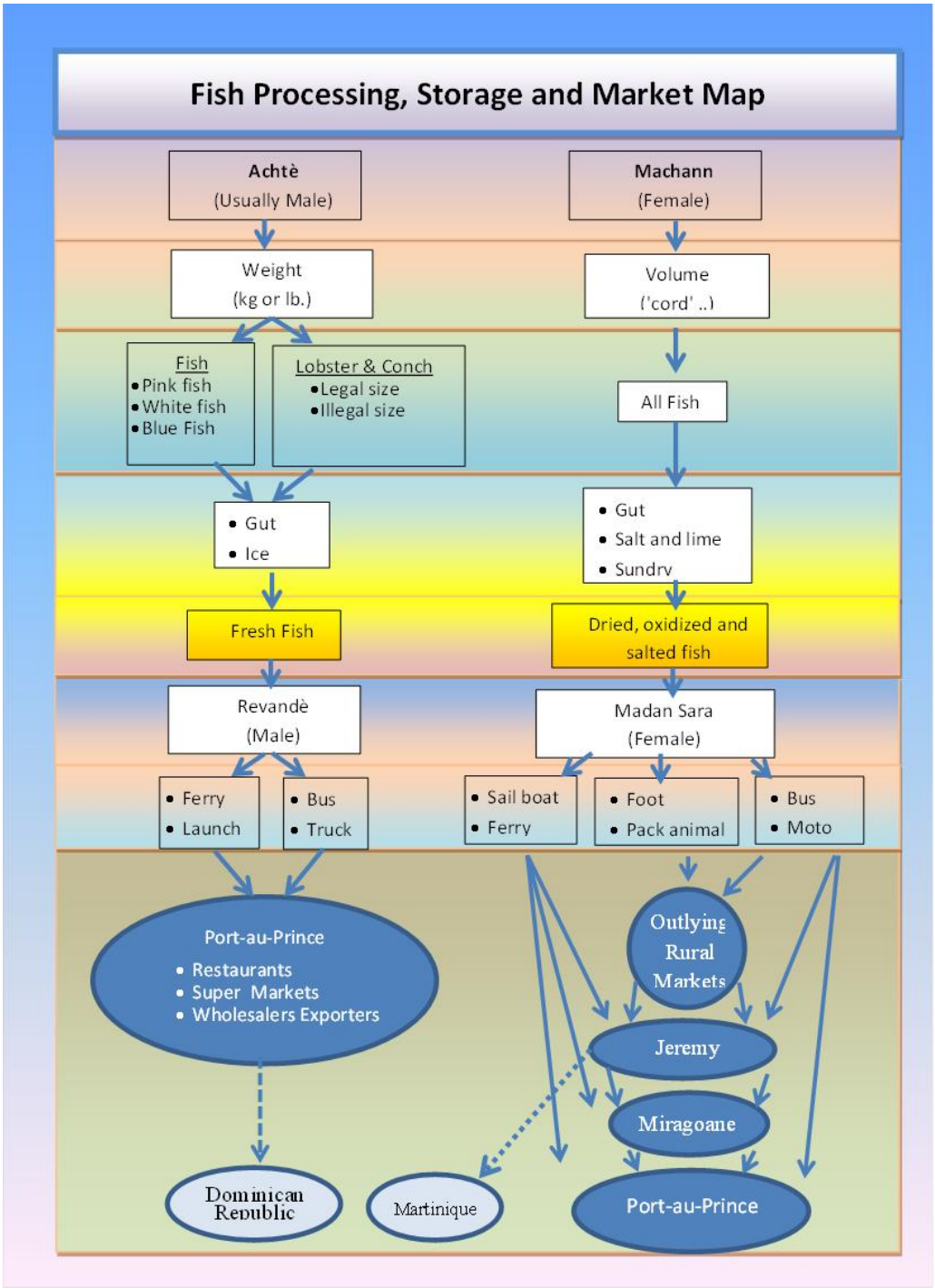
The ***achtè*****,** almost always a male, is linked to the modern deep sea industrial fishing strategies seen discussed above, those who use long lines and exploits FADs to catch large fish prized in urban restaurants, elite and expatriate households, and the tourist sector. As such he represents a relatively new market chain. The *achtè* deals only in fresh fish. He buys the fish based on weight not volume. He has an adult woman or child family member – usually a girl – clean the fish. He then preserves the fish on ice. He may sometimes sell the fish to a *machann* but he is usually linked to urban purchasers and his primary objective is to get the fish to the city on motorized sea vessel or bus or take them himself by boat or bus to the urban market. (Elsewhere in Haiti the *achtè* shares his

[1] The term *madan sara* derives from a highly gregarious, little yellow and black bird introduced to Haiti from Sub-Saharan Africa. Known in English as a Village Weaver (*Ploceus cucullatus*), the female seems to be constantly collecting food and twigs and carrying them back to her nest, usually in a tree full of hundreds of other nesting *madan sara.* Similar to the buzz of voices heard from Haiti's rural markets, the traveler knows when approaching a colony of *madan sara* because of the noisy din of chatter from hundreds of busy birds.

position with the "association" which also purchases for the urban mark. But for the current study we only see the association in Anse Hainaut region.)

As seen in the discussion of Anse Hainault, industrial deep-sea fishermen earn significantly higher income for their efforts. This derives not only from bigger fish and more of them, but from the fact that fresh fish yield 40 to 60% greater prices than what the *machann* can fetch in the local regional market or the urban popular market. The map on the following page illustrates to two market chains.

Figure 12: Fish Processing-Storage-And Marketing Chain I



Understanding the Purchasing, Processing, Storage, Transport and Market Marketing Map

Capital and Credit

A significant and telling characteristic of the entire fishing production and marketing system is that the fishermen carry the burden of capitalizing the rest of the market chain. Rather than urban agencies, the *achtè* or *machann* giving credit to fisherman so that they can invest in materials and supply fish to the market, it is the fisherman who gives fish on credit to the *machann* and *achtè*. However, the *machann* is more inclined to lend the fisherman money when he is in need. The *machann* also more often a wife, or family member of the fisherman or at least a local woman. The loan that she sometimes extends and the fact that she is embedded in the fisherman's personal family or social network also means that she exercises an influence on him beyond the sale price of fish. When the fisherman does sell to the *achtè* he often preserves his relationship by sharing part of the proceeds with a *machann.* This personal relationship adds a level of risk management and social integration that goes beyond that most fishermen have with the *achtè*. Moreover, because the *machann* is often family means that the profits from the fish might be less overall, but the fisherman's household reaps rewards at more than one value added link in the market chain.

Purchasing Categories

The *machann*, market woman, is not especially interested in lobster and conch, both of which she cannot or does not dry. With regard to fish, she is interested in volume. There is some advantage for her regarding small fish, which are easier to clean and dry and less inclined then large fish to get worms after dried. Moreover, her rural clientele typically cannot distinguish Parrot Fish from a Grunt. Thus, the *machann* is not inclined to pay as much attention to fish types. The influence of the *achtè*, on the other hand, gives way to three categories of fish: *Pwason Woz* (Pink Fish), *Pwason Blan* (White Fish), *Karabela* (Blue Fish – in other areas of Haiti the category is sometimes "black"). The categories do not strictly correspond to the color of the fish but are more accurately explained as combination of size and type; both of which are market determined. Pink Fish are the most desirable; White Fish less desirable; Blue Fish--the small fish, juveniles, and rejects from the other categories--the least desirable. Lobster--the most lucrative product for both fisherman and *achtè* but not as commonly caught as fish--and conch fall into two categories: one for the internationally legal marketable size and another price category for undersized specimens.

Storage, Transport, and Markets

The ***achtè*** faces a significant risk. Without ice or refrigeration uncured fish spoil. None of the outlying fishing communities in Nippes and Grand Anse have electricity. Except for Anse Hainault, cold storage is close to non-existent. Only Point Sab and Wozo have cold storage rooms and neither one was functioning at the time of the survey. Ice must be shipped in from Jeremy. All of this means that preserving fish until the time of transport is a risk. Transport itself adds another layer of uncertainty. Anything can and all too often does happen. A transport boat may have to pull into a remote harbor for fear of foul weather, a bus may get a flat tire or overheat, a road may get washed out or rivers engorged and trucks cannot pass, gas rations may suddenly run out, a buyer may back out of a sale, political unrest and riots may shut down all

transport. In the case of any of these events – all realities of life in Haiti – the achtè has only a limited time to find ice and keep his fish from rotting.

Not only must the *achtè* confront the problem of transport, but the market itself depends largely on the Port-a-Prince economy. Tourism in Haiti is all but non-existent. Restaurant and hotels depend largely on a clientele of visiting diaspora, NGO workers, and diplomats. Any one of the frequent political crises that plague the capital can bring business to a grinding halt. The holder of fresh or even frozen fish cannot easily turn to overseas markets. As seen, US and Europe have both banned the importation of seafood from Haiti. Getting the fish into the Dominican Republic means dealing with corrupt and fickle border agents and then accessing equally fickle and opportunistic middle men, most of whom look on Haitians through a lens of historic antagonism. On top of all of this, the Dominican hotels and restaurants have a domestic fishing industry more developed than Haiti's and they have readier access to purchasing from overseas suppliers.

The fact that the ***machann*** or ***madan sara*** has cured her fish means that she is not in a hurry. She can accumulate fish before going to market. The dried fish are also more easily transported. She puts them in sacks, place basins or woven baskets. She then transports the fish to market carrying them on her head, on pack animal, by bus, boat or truck; whatever means assures her the greatest profits.

The *machann* sells her fish on Haiti's internal rotating market system. In villages throughout Haiti, open air markets are held on specific days of the week. In any given region the days alternate between nearby market villages such that people living in a particular area are within walking distance of at least two markets per week. The evolution of these markets is organic in the sense that they have not been planned; rather it is system that has evolved over at least two centuries of intensive intra- and inter-regional trade. The markets are associated with a vibrant female dominated commercial sector. This means to the *madan sara* who sells fish is that she has a highly stable outlet for her products, one that is accessible through her own efforts, i.e. if she can, and often does, heft her merchandise onto her head and walk.

NGO Interventions, Associations and the Market Chain: Putting Women out of Business

NGOs have intervened in the purchasing-processing-storage-and-marketing chain to help fisherman get better prices for their fish and thereby bolster income to impoverished households. In doing so, they encourage the formation of male dominated fishing associations. In addition to help with offshore fishing, they also often provide the associations with coolers and cold rooms for conserving fish and they help link the associations to urban purchasers. In doing so they may have delivered two inimical blows to the impoverished households that depend on fishing:

1) by encouraging the sale of fish directly to urban markets they deprive households of the opportunity to profit at three additional links in the value added chain: processing, transport, and sales.

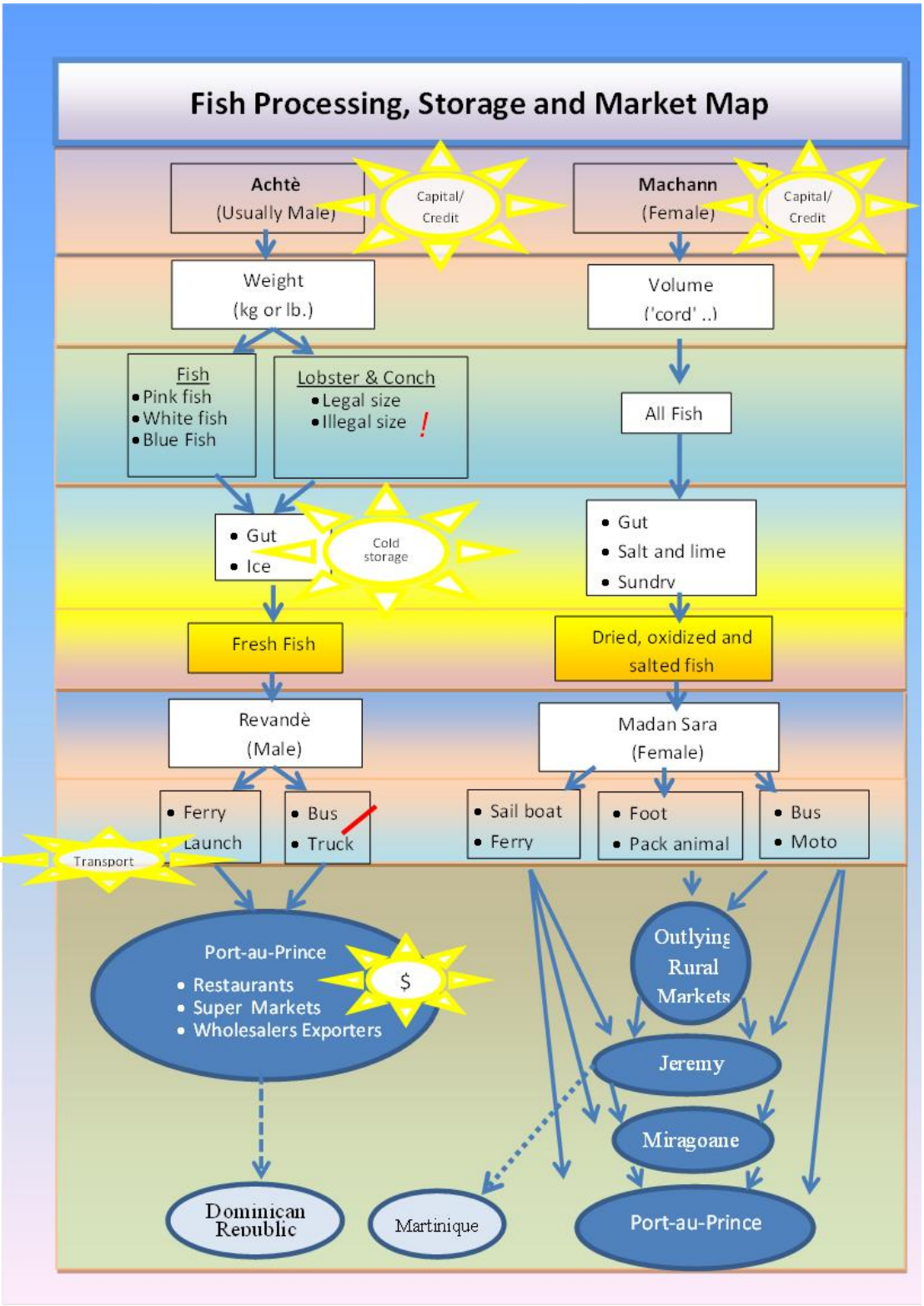
2) by helping facilitate the entrance into the market chain of male dominated associations, they may have unwittingly initiated a process of supplanting women from the fishing market chain; indeed, the oddity of the male *achtè* in the midst of the almost entirely

female dominated sphere of rural market intermediaries suggests that his role may have evolved from the associations.

Discussion: Problems and Points of Intervention for Purchasing, Processing, Storage, Transport and Market

Several points leap out regarding the market system. First off, it is left to the fisherman to underwrite the trade in fish by providing credit to purchasers in an environment of scarce capital, tenuous market conditions, and difficulty in reaching. The *achtè* offers a better return: his prices are 40% to 60% higher prices than the *machann,* a profit that fishermen are loathe to forego. But with the *achtè* there is greater risk. Given the poor infrastructural conditions, political and natural disasters that occur in Haiti, the *achtè* could and sometimes does lose everything, or, when all else fails, he unloads his stock on the *machann.*. The *machann,* by virtue of curing her fish and access to the vibrant local market, is unlikely to lose anything at all. If she cannot sell her fish, her family can eat them over a long period of time. Moreover, with the *machann* there is the consideration of investment in social relations, capturing household income at multiple points of the market chain, and risk management. The fisherman who is not loyal to his *machann* runs the risk of losing an important source of support during times hard times when he might wish to borrow money from her. By selling to the *achtè* he is also working against what is his most important source of social security, household level production and the local marketing system.

Figure 13: Fish Processing-Storage-And Marketing with Points of Intervention and Opportunity
(Key: ! = points of ecological crisis; ☼ = opportunity)



The Other Livelihood Strategies

We turn now to these other livelihoods strategies, an area where the GRC may wish to concentrate efforts but that, at the least, should be understood so to more effectively target interventions and reduce negative impacts.

Only some 1 in 10 Haitian men know how to fish. The Haitian government in the form of MARNDR estimates that about 80% of these men are full time fishermen. While that may be true elsewhere, in all the communities we visited during the course of this study people reported being as or more dependent on other livelihood strategies: specifically, agriculture, livestock rearing, and making charcoal. These are the mainstays of livelihood and survival strategies not just in the region but throughout Haiti, they have evolved over 200 years of independence and, like fishing, have roots in pre-Columbian and colonial strategies of survival. They are also complemented by a wide array of other endeavors (salt production, fruit trees, artisanship) and they are brought to fruition via female dominated commercial enterprise focused on what anthropologists call Haiti's internal rotating marketing system.

The sum of these enterprises and their market vortices results in a fascinating degree of integrated economic unity for the country as a whole. The internal marketing system links micro climates and regions to one another; it links country to town; and it links town to city. In doing so it helps impoverished Haitian households reduce risk and ameliorate economic fallout from crises. Indeed, it is precisely Haiti's history of recurrent natural, economic, and political shocks that has conditioned and created the particular formulation of contemporary livelihood strategies. In order to understand the rural domestic economy, how the people living there have survived crises before and after NGOs arrived, and even how Haiti's urban populations have coped with military and popular uprisings and international embargoes, and ultimately how we can most appropriately intervene during times of crisis, it is necessary to understand this system.

The Three Pillars of Haitian Rural Livelihoods

In all the communities visited, fishermen ranked agriculture as equal to or greater in importance than fishing. Agriculture is the pillar of the Haitian economy. The fisher-farmers intercrop sweet potatoes, yams, manioc, and plantains. These crops are known as *viv* (live), and with the exception of sweet potatoes, they are available year round and during the most severe crises. They also plant corn and beans, plantains, melons, squash, and peanuts. Emphasizing the persistence and adaptability of the subsistence orientation of this livelihood strategy, five of the major crops were the very same five crops most important to the Taino Indians who inhabited the area in pre-Columbian times (manioc, sweet potatoes, corn, peanuts, and pumpkin). The people in the region also benefit from at least 18 fruit and nut bearing trees that provide an almost constant yield – of at least several – throughout the year and that include staples such as breadfruit and avocadoes. Sources of cash are coffee, cocoa and coconuts.

The second pillar of the regional economy is, as elsewhere in Haiti, livestock. In every community we visited people owned livestock. In communities such as Petite Trou, where private agricultural plots are widespread, livestock must be tethered and strict penalties are to be paid for those whose animals ravage their neighbor's gardens. In more remote communities –

such as on the island of Cayemite, Oba, the hamlet of Grand Anse and on the peninsula of Gran Boukan – most land is State owned land and people free range their livestock. On the more fertile and humid island of Cayemite cattle are the primary livestock; in arid areas such as Gran Boukan goats prevail.

The third pillar is manufacturing charcoal for the urban market, a major productive activity for virtually every low-income household in the region and the most important economic backstop in times of crisis. [xiv] [xv] [xvi]

Technology

The tools used in performing these livelihood strategies are, for the vast bulk of the population, no more complex than picks, hoes, and machetes. Animals are free ranged, tethered to bushes with rope. One does not even see barbed wire; rather, gardens, homesteads, and the rare corral are enclosed with wooden stick barricades or living fences made of fast growing and malicious vegetation such a dagger-like sisal, cacti, and poison oak (*katoch, kandelab, pit, pigwen* and *bawonet*). As seen with fishing rowboats, bamboo fishing traps, and string nets. People in the region do not use cows or horse traction to plow fields. There are few pumps; farmers with gardens plots near to springs and rivers sometimes manually haul buckets of water to irrigate crops, particularly vegetables in cool highland areas. Irrigated land is scarce. The use of chemical or processed fertilizers and pesticides is almost entirely confined to highland vegetable gardens and, to a lesser degree, beans (also considered a cash crop), that dependably yield profits. Many houses are made of local stone or waddle and daub and roofed with plaits of *vetiver* grass or palm.

What we see above are livelihood strategies that, similar to artisanal fishing, differ little from those practiced during the pre-Columbian and buccaneer eras and are significantly less technologically and organizationally complex than those that prevailed during the colonial epoch. Moreover, the anachronistic character and tenacity with which people all over Haiti cling to these strategies and their resistance to adopting or maintaining new material and organizational technologies is a major impediment to the success of most international development projects. It confounds all of us who come to the country to work as international aid workers or to set up corporate enterprises. Yet, from the perspective of adaptation to crisis, the system is eminently logical.

Adaptation to Crisis

Since 1851, the Haiti's Southern peninsula has been hit with 18 hurricanes and 25 tropical storms: one severe storm every 3.7 years. Hurricanes are not as devastating as outsiders often think. Pigeon peas, manioc, yams, and sweet potatoes actually benefit from the rain. It is perhaps hardest on livestock, which die from exposure, drown, or even sicken from the abundance of green foliage that sprouts in arid areas following torrential rains. While the winds can be destructive, the Grand Anse and Nippes areas – and most of Haiti – have the luck of being on the leeward side of mountains that break the winds. This means that in the vast majority of cases, heavy rain is the principal fallout. Prolonged droughts tend to be worse than hurricanes. Fishing provides a reprieve from drought and even benefits from it. The reduction in runoff that occurs during drought causes the water to be more clear and fish come closer to shore. Divers can see their catch better. Sea turtles are more easily caught. With hurricanes, the heavy winds "stir fish," as Haitians say, increasing yields after the storm has passed. Until recent construction of cement

schools, hospitals and homes, earthquakes had little to no impact on rural populations and damage is still largely confined to towns and cities.

Arguably more destructive than the natural disasters and a more important factor in conditioning dependency on the rudimentary livelihood strategies and technology have been frequent manmade crises. Haiti's unique political history and place as a rebel among the nations as of the world has made it especially prone to these. It began with 100 years of slavery during which time the slaves planted their own subsistence crops, through 13 years of what was arguably the deadliest fighting in world history, through the 19th century with more than 25 wars and uprisings and 60 years of international trade embargoes, and continued through the 20th century with an equal number of violent conflagrations, civil unrest, revolution, and more embargoes to first tumultuous 15 years of the 21st century. Haitians are stuck on an island surrounded on three sides by water and one side by a neighbor whose political leaders so despise and denigrate Haitians that they once saw fit to massacre with blades and in the space of three days 25,000 of those living on their side of the border. The rural population has had little choice but to adapt. They have done so by cultivating dependency on those forces they can control: the technological simple and integrated production, processing, and marketing strategies seen above. [xvii] [xviii]

The Internal Marketing System

The Agricultural-Livestock-Fishing-Charcoal livelihood system comes together in the Internal Rotating Market system introduced in an earlier section dealing with the *machann* (female market woman). As seen throughout the region, open air markets occur on alternating days of the week such that people living in any given region have walking distance access to at least two markets per week. Montane micro-climates, their differing rain patterns, and the consequently differently timed harvest season make it logical for farmers to sell their crops rather than risk losing them to insect and mold and then store surplus in the form of money. The opportunity has facilitated the evolution of the intense interregional trade seen earlier, that dominated almost entirely by women, the *machann* and *madan sara*.

The system is such that women may sell daily small quantities of items produced by the household- such as eggs, manioc or pigeon peas. But the prevailing strategy is for one women to specialize in a particular item, such as limes, buy small quantities from multiple farms, accumulate a profitable quantity, and then take them to market or sell them to another intermediary higher up the chain, one more heavily capitalized, who accumulates greater quantities and who is likely destined for a larger town market, city or, the holy grail, Port-au-Prince.

The important point for the analysis and understanding how to target interventions is that while this is a market system, it is emphatically not oriented towards “wants,” but rather subsistence and local production. The overwhelming bulk of products sold are inexpensive, locally produced and somehow related to production and subsistence; with respect to the profits that the *machann* earns, the bulk of the money is destined for reinvestment in commerce, other income generating enterprises – such as fish traps – or spent on subsistence foods and necessities for the household and, ultimately, the growing '*mama lajan*' (literally "mother money," or more technically, the principal or capital) preserved for economic recuperation during times of crisis.

This market system bleeds over into a burgeoning economy of micro-producers, service specialists and petty vendors including porter, butcher, baker, tailor, basket maker, rope weavers, carpenter, mason, iron smith, mechanic, mariners, boat makers and host of marine specialties that keep the boats afloat. Micro vendors from the most remote homestead to the towns and cities sell everything from a single cigarette and shot of rum to telephone recharge cards to hair ties to small bags of water to cures for cancer and unrequited love and bad luck or dozens of different lottery tickets.

In summary, while yes, people in remote fishing communities of Nippes and the Grand Anse live on what is a close parallel to stone age livelihood systems, they are not idle. They live and interact with one another in the context of a vibrant and intensely integrated production and marketing system adapted to centuries of crisis that many visiting aid workers and even many Haitians are not even aware. And it is precisely the adaptation to crisis that best explains the reluctance to adapt new technologies that often confounds aid workers trying to help.[xix]

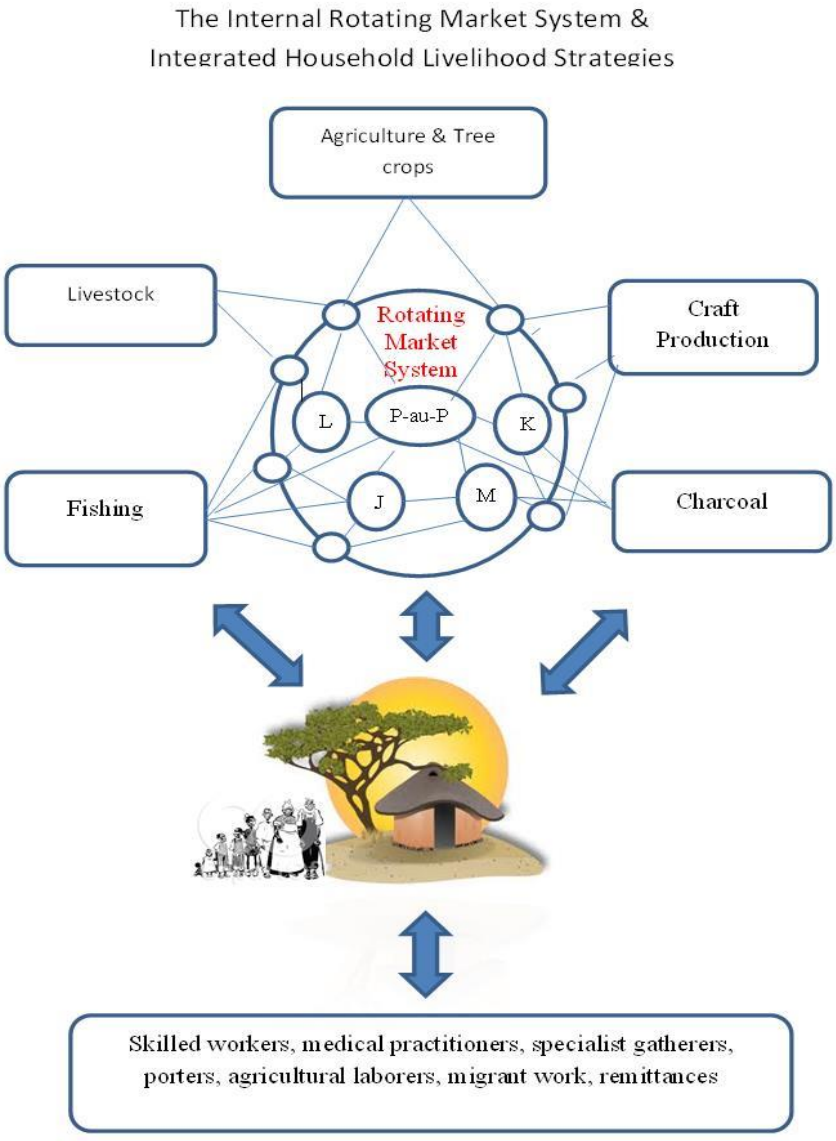


Figure 14: Internal Rotating Market System

Crisis Response

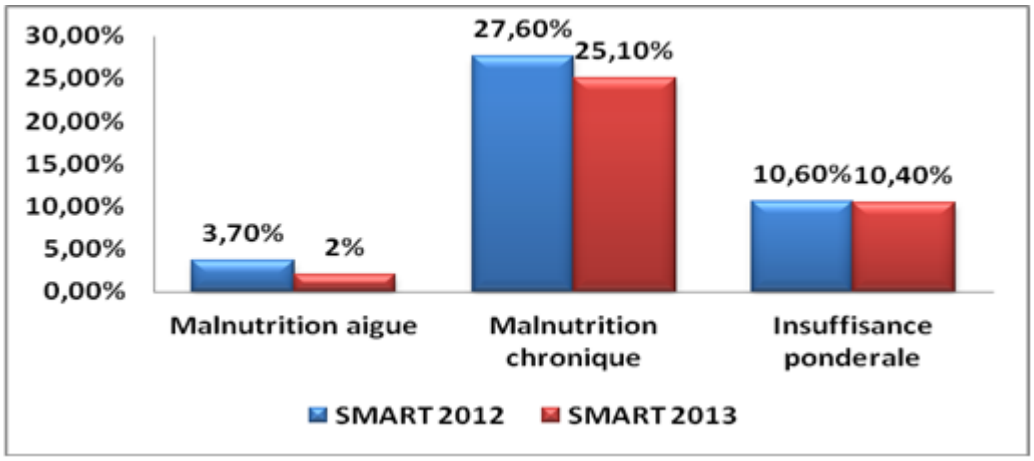
When crisis does strike, the rural majority as well as the town poor, resort to consuming the hardy subsistence type garden foods described above – what could be called survival crops and in fact are called *viv*, "to live" – specifically manioc, yellow yams, sweet potatoes, plantains, taro and breadfruit (all crops that preserve in the ground and above the ground for long periods of time without processing). The principal means of dealing with the cash deficits brought on by crisis and meeting those critical needs that require cash – such as medical care, transportation, tools, and seeds – are the sale of livestock and the production of charcoal.[xx] The reduction in livestock is an ecological advantage in that it gives a reprieve to overgrazed foliage. A renewable resource cut from the dry forest the prevails along the coast, the importance of charcoal production, both in terms of a safety net and an ecological calamity related to crisis, cannot be overstated. As longshoremen who work the wharfs of Port-au-Prince well know, one can tell what region of Haiti is undergoing crises by the origin of the shiploads of charcoal that arrive. Recourse to charcoal production in times of crisis is such that it can be argued that the Grand Anse and Nippes, as well as other regions of Haiti, have progressively become deforested not so much with steady demographic increment, but rather in fits and starts with the increasingly frequent embargoes, political uprisings, crisis in world food prices, droughts, hurricanes, and now earthquakes. [xxi] [xxii]

For hygienic and household needs during times of scarcity, farmers also have recourse to hundreds of natural and homemade substitutes for items like soaps, shampoos, hair laxatives as well as water containers, lamps, ropes, beds, fasteners, and shoes. Most items regarded as a necessity have homemade and cost-free substitutes. [xxiii] A recent and important recourse to income is the burgeoning motorcycle taxi industry that reaches into all but the most remote areas. Motorcycle taxis are used to haul freight as well as people and have become a significant economic mainstay throughout the present crisis.[xxiv] [xxv]

In summary, the livelihood strategies that prevail in the area and throughout Haiti are not – as sometimes thought by observers – subsistence strategies in the pure sense of the word. The people in the region do eat some of the plants they cultivate and the fish they catch. But they are oriented toward cash as a form of storing surplus and the market for subsistence purchases.

In this way the system can be conceptualized as a regional survival-oriented strategy that links household, communities and ecological zones through the rotating market system, and in doing so averages the impact of crisis out across the landscape. Part of the reason that it has been so effective is that Haiti's mountainous terrain and corresponding micro climates have meant that environmental crises that would impede production at the household level rarely impacts an entire region. When it does, such as with Hurricane Sandy, the people are able to turn for food to their garden *viv* and artisanal fishing; for cash reserves to the *mama lajan*; and for new cash, to sale of livestock, and charcoal production for the urban market. Evidence of the effectiveness of the strategy comes from the observation that malnutrition levels in the Grand Anse were greater in 2012 than in 2013 – when researchers not familiar with Haitian livelihood strategies were predicting that damage from storms Sandy and Isaac would be causing famine (Kolbe et. al. 2012; AP 2012. [xxvi]

Figure 15: Comparison of 2012 and 2013 Malnutrition Levels in the Grand Anse



Source:Resultats obtenus à partir du logiciel ENA

NGOs and International Aid Interventions Gone Bad

In times of crisis international relief agencies have sometimes interjected themselves into the system described above to the detriment of impoverished Haitians they intend to help. The most well-known example in Haiti is food aid and agricultural production. Beginning in the 1970s, and accelerating significantly during the 1980s, the US and EU governments used NGOs to distribute surplus agricultural produce from their own domestic farm price support programs. The negative impact of undermining local prices and corresponding declines in income and production has been meticulously documented at the local level by NGOs themselves (Schwartz 2000) and at the national level (Kinley and DeWind 1988) [xxvii]

Even for those who do not agree that food aid crashes the local agricultural market and undermines production, no one can ignore that food aid distributions in Haiti are plagued with graft, greed, and corruption among those who are charged with distributing the aid and resentment among those intended to benefit. Ugly conflicts and even violence over control of the food are common. In the Grand Anse the Red Cross has seen groups determined to control distributions threaten to burn the houses of would be beneficiaries.

Another example of an aid intervention that is arguably damaging to the livelihoods of those impoverished Haitians ostensibly meant to benefit is micro credit provided at absurdly usurious annual rates of 60 to 80 percent--enough to bankrupt a successful developed world business. With regard to rural Haitians--the most impoverished population in the Western hemisphere--is it is something that, if successful (and it emphatically has not been), it would have meant taking more than half of the income from trade away from *machann*. This issue of micro-credit is especially poignant in the context of the discussion earlier regarding the integrated household livelihood strategies and the internal rotating market system because there is a very real scarcity of capital, it affects fishing households, and it is an area where the GRC can have an immediate impact.

A good illustration of the importance of interventions at the market level and with regard to capital is a paradoxical twist of economic morality with regard to the heavily capitalized male and female *komesan* (large vendors of imported goods). the figurative nemesis of the *madan sara* (the usually smaller and little capitalized itinerate traders of local produce). The *komesan* are able to exploit the traditional market woman's desperation for credit to get her to buy their imported sacks of sugar, rice, flour, corn and beans and then turn around and sell them for less than she paid. Here is how they do it: the *komesan* sell their imported staples to the *madan sara* on credit. The woman has 21 to 30 days to pay for the sacks. If she sells it at retail market prices she stands to earn about 20% profit. But because boutiques and many other women also get the foods on credit and sell imported flour, rice, and sugar out of their homes, the products sell slowly. So rather than wait and make a small profit, the *madan sara* dumps the imported sacks of food at below market prices so that she can get the cash and trade in domestic produce, an endeavor in which she can earn more money faster. But the aggregate impact of what she has done is to subsidize agro-industrial imports from developed countries (imports that were already subsidized in the countries of origin). In other words, she is undermining her own local economy. And once again, the reason she does it is because of her desperation for market capital.

As seen with *machann* who purchase fish, there is indeed a scarcity of capital and it is the fisherman who underwrites the movement of fish up the market chain by providing credit to both *machann* and *achtè*. But here, with fishing, we saw another inimical, if unintended, assault on the livelihood of the Haitian market woman. Well-meaning NGOs hoping to aid fishermen initiate the formation of male dominated associations and in doing so they promote male purchasers as market intermediaries, effectively interceding in what was traditionally a female dominated link in the market chain. It is at this juncture that the GRC could provide aid in a way that could not be interpreted as encouraging artisanal over-fishing, nor encouraging the controversial harvesting deep sea fish species, but that would reinforce traditional integrated livelihood strategies are the level of marketer. Specifically, they could give cash grants to female VSLA (Village Saving and Loan Associations), thereby helping fortify female marketing in the face of competition from the urban linked *achtè*. [xxviii] [xxix]

What To Do?

When asking the question how should organizations such as the GRC intervenes to help the poorest fisher folk in the region, the question really should be, "What do we hope to accomplish in the long run?" If the objective to help the most impoverished Haitians continue to maintain some degree of autonomy and resilience to unforeseen environmental, economic and political calamities that are surely to come, then we should take note that the system upon which they currently depend has evolved as a response to centuries of such calamities; we should be considering not how to make them dependent on world markets and imported material technologies; but rather how to reinforce the strategies that already exist, make them more productive and ecologically sustainable. And we should take great care that the interventions we do offer do not do violence to those livelihoods – as in the case of promoting the male *achtè*. On the other hand, if we hope to bring Haitians into the world economy by subsidizing dependency on industrial technologies and mono-livelihood strategies, then we should remember that in the past two decades alone the international community has not simply abandoned Haiti at times, but twice embargoed them and cut them off from international trade and access to those technologies. It is arguably precisely this tendency to economically isolate Haiti and the

tumultuous local politics that explains why Haiti is a 21st century technological anachronism. This is something over which organizations such as the GRC had little control.

Recommendations

There are good reasons that organizations such as the Red Crosses should be cautious about intervening to repair or promote any fishing livelihood strategies in the region. The currently depleted ecological state of Haiti's coastal shelf is a major strike against supporting artisanal fishing strategies. Indeed, aid to artisanal fisherman could be construed as helping current fisherman haul aboard the last of the juvenile fish and thereby facilitate the elimination of the artisanal fishing livelihood strategy altogether. Aid to artisanal fishermen may even attract more new fisherman, further expediting the slaughter.

A strike against higher tech offshore fishing is the disdain with which it is viewed by most environmentally-conscious people in the developed world – many of whom fall in the class of likely Red Cross donors. However few fish Haitian fishermen will catch compared to the industrial fishing fleets of the US and Japan, it is precisely FADs (fish aggregating devices) that critiques have identified as culprits in the disappearance of long-lived pelagic fish species, almost all of which are in precipitous decline.

Thus, the most important recommendations are,

- Intervene with local market access for the fish that are being caught, specifically by reinforcing the purchasing capacity of *machann* through women's VSLA (Village Savings and Loan Associations). Aid to market women in the form of cash grants to women's VSLAs would help empower women vis a vis the encroachment of the male fish intermediary who is invariably from the ranks of wealthier men in the community; it would reinforce the integrated household livelihood strategies described above; and it would help women build their market capital, one of the main resources that households fall back on in time of crisis.

- Vigorously pursue the provision of ambulance boats to the more remote communities in the region, something that would help save lives in the frequent cases of accidents at sea, when foul weather strands artisanal fishermen, and in cases of injury and complications during childbirths. It is noteworthy here that the Red Cross has already purchased three ambulance boats and they sit in its Petite Trou compound. Because of licensing and red tape with the local government, the boats have been sitting there for a year with no resolution in sight. In that time, one village that would have received one of the rescued boat three people could have rescued three people who drowned after their boat capsized and help arrived late; in another of the villages a woman who could have been rushed to a mainland hospital died giving birth. The Red Crosses, particularly the Haitian Red Cross, should consider it inexcusable that the Haitian authorities will not process the paper work for the boats.

- A strategy recommended for future short term interventions is,

  - Developing a system for intervening at the level of school tuition during times of crisis, i.e. giving tuition vouchers to village children: cutting child tuition and school expenses is a common byproduct the poorest households resort to in times of crisis. Paying tuition means letting parents use cash to meet other household needs. Red Crosses could efficiently get aid to needy households while doing no harm to the equilibrium of livelihood strategies and the market economy.

- If considering interventions that target modern offshore fishing, the two most important options are,

  - Cold storage facilities placed under the control of VSLAs
  - Transport

- Very importantly, the Red Crosses should turn to other areas of intervention, for fishing strategies and commerce are embedded in an array of livelihood strategies that may provide better targets for interventions

- Any longer term options that focus on fishing should consider conservation of marine resources, encouraging community regulation of resources, and introduction of technologies that reinforce organization, such as use of Lobster Aggregating Devices and community participation in the construction of artificial reefs. Based on the logic of avoiding disaster before it strikes, or even averting a slow moving disaster that is already underway, we could participate in programs that help restore and manage Haiti's coastal marine resources. The GRC could join with Haiti's three marine biologists or the few organizations that seem to be taking the issue seriously to construct artificial reefs, introduce of Lobster Aggregating Devices that allow selective harvests, promote marine aquaculture, and help communities self-regulate catches. Indeed, perhaps where the Red Crosses could have their most powerful impact is in using Red Cross network of volunteers to promote a comprehensive coastal fishery conservation strategy including all these activities and in doing so help build grassroots organizational structures that in the absence of State management would help restore the coastal fisheries. This could provide livelihoods and a high value source of protein for generations to come. As seen, the Haitian ministry responsible for regulating the marine environment and fisheries (MARNDR) recognizes the need, but lacks the resources to address. Moreover, the political incorrectness of encouraging intensified fishing has meant that other organizations have devoted resources to more heavily inland aquaculture. In the meantime, the crisis on the coast continues

Notes

[i] see http://fex.ennonline.net/35/emergency.aspx)

[ii] http://www.youtube.com/watch?v=-v_ULYsYoqA

[iii] The construction EMMA in question reported 1,500 to 2,500 gourdes per day (~U$37.50 to US$62.60) for semi-skilled workers and 2,250 to 3,250 (~US$56.25 to US$81.25) gourdes per day for skilled workers. At the time the prevailing wage in Port-au-Prince for semi-skilled construction labor was 400 to 700 (US$10 to US$17.50) and 500 to 1,000 respectively (US$12.50 to US$25.00). In the largest urban and peri-urban areas outside of Port-au-Prince, including Jacmel and Leogane, the prevailing wages for semi-skilled labor was 300 to 500 (US$7.50 to US$12.50) gourdes and skilled labor 500 to 800 gourdes (US$12.50 to US$20.00) – See International Rescue Committee et. al. 2010

[iv] In Haiti women are usually thought of as the owners of household garden produce, but if a male is present, the gardens are thought of as male property and responsibility, i.e. his contribution of the household resoources. The difference is significant. Investment and maintenance of the gardens is overwhelmingly a male activity and responsibility. Misinterpreting or misrepresenting the gardens as "female owned" bias interventions toward contributions or credit to women, who would more likely not invest in productive gardens but rather commerce, their chief economic activity. (To access this particular maps see "EMMA Introduction and Overview Chapter," page 10, http://practicalaction.org/docs/emma/EMMA-introduction-and-overview.pdf)

[v] The EMMA only tangentially identified the local timber supplies nothing consumers in this market chain as the "poorest families," ignoring the thriving trade in local woods, the high quality and high demand for it among all classes, particularly regarding furniture, and overlooking that fact that international supply chains had no pre-earthquake distribution networks beyond the major urban centers. (For the map and an example of how it made it into the post-earthquake international decision making process see, Harvey and Bailey, 2011; page 26).

[vi] For the report that identifies Jacmel area as experiencing a recession, see Meaisner et. al. 2010; Page 6. For the unpublished report that suggests Jacmel was experiencing an economic boon see Schwartz 2011.

[vii] Most of the problems identified with the EMMA strategy could be summed up as byproducts of researchers who are unfamiliar with the country and working for institutions embedded in the formal economy trying to research and assess in a couple weeks what is an overwhelmingly informal, highly complex, and poorly understood economy. The conundrum is especially applicable in the case of Haiti. In the words of Ira Lowenthal, US anthropologist, aid worker, and resident expatriate in Haiti for 40 years, "Haiti is the most studied underdeveloped country on earth; and the least understood."

[viii] Drawing on CRFM's 2010 evaluation of fishing in Haiti, The National Fisheries Service estimates that 21,000 (60%) of these are full time fishers, whilst the rest 6,000 (40%) are part-time fishers. When one follows the trend over the past two decades, the estimates are as follows: 1985 – 11,000 (www.cam.org); 1989 – 12,000 (UNDP / FAO); 1999 – 17,148 (FAO); 2001-30,000; in 2010 MARNDR put it at 52,000

[ix] Haiti's Reefs Most Overfished in the World Post date : 2011-03-30

http://reefcheck.org/news/news_detail.php?id=726

[x] Having said that, all Haitian fisherman combined currently catch less Pelagic fish than a major industrial fishing boat; and the temporary relief for the shelf and the economic interest that would come from offshore fishing could galvanize Haitian interest in conservation--I said "could."

[xi] see, Green Peace Blogs: http://www.greenpeace.org.au/blog/?p=77 and
http://www.greenpeace.org/australia/en/news/oceans/What-is-sustainable-tuna/

[xii] For Food for the Poor boats, see Net News 2008 "Florida charity changes lives in Haiti"

http://www.caribbeannewsnow.com/caribnet/haiti/haiti.php?news_id=5627&start=1040&category_id=2

xiv

Sweet Potato (Impomea batatas): In calories per square meter, sweet potatoes are the most productive tropical cultivar on earth. They have few natural pests, and from planting to first harvest, they can produce as much as twelve metric tons per acre on as little as four inches of rainfall. There are dozens of varieties of sweet potatoes, which are recognized for features ranging from the ability to resist drought to the tremendous size of the potato. All varieties begin yielding in from two to six months. Cuttings must be planted when the ground is moist, but thereafter provide a continuing year round harvest, yon manje tout tan (a food at all times). After the initial planting, the vine itself becomes drought resistant; it withers during long dry spells, and its fruit degenerates. But the vines go into a state of dormancy and come back vigorously when it rains and the more it rains the more the vine produces. When harvesting sweet potatoes, a farmer need only re-bury the remainder of the vine for it to continue growing. Patches of sweet potatoes endure for several years and would endure indefinitely if hungry children did not help themselves, digging the sweet potatoes up and roasting them whole in small fires (see Bouwkamp 1985; Onwueme 1978).

Yanm (*Dioscorea cavenensis*), are not known as a high caloric yield per input crop but low technological requirements for planting and harvesting mean that can produce even higher food calories and protein annually per hectare per season, on average, than even sweet potatoes and manioc. .It can be planted during dry spells and will begin to grow with the first rain, grows as long as there is rain and then lies dormant during the dry season. Like manioc, it can be stored in the ground indefinitely serving as an important food during droughts and other crisis (FAO 1989; Oke 1990).

Cassava (Manihot utilissima): Cassava is a close competitor with sweet potatoes for the most productive tropical food plant in terms of calories produced per square meter. It needs more rain than sweet potatoes to grow, but it is more tolerant of drought, easily surviving dry periods longer than six months. Further, unlike sweet potatoes, cassava has the unique ability to be stored in the ground and it is hurricane proof because it can lose all its leaves and its branches may break, but the root, which is where the food is, will not die. After drought or hurricanes, the plant draws on carbohydrate reserves in the roots to rejuvenate itself. Cassava is propagated by cutting short lengths of its branches, and these sticks can be stored for as long as five months. There are least five varieties of bitter cassava and five varieties of sweet cassava. Cuttings can be planted at any time, even in the dry season, and will remain until the rains come. Depending on the variety of cassava, the type of soil, and the frequency of rainfall, the roots are ready to harvest anywhere from six months to one and a half years but can be left in the ground for up to four years. After the tree has reached maturity (at one and a half to two years), farmers will often trim branches, allowing for the planting of other crops and the harvesting of the cassava roots as needed over a period of several years. When harvesting, portions of the roots are commonly left in the ground to grow back (see Toro and Atlee 1980; Cock 1985).

Pigeon peas (Cajanus cajan): Pigeon pea roots reach six to seven feet beneath the surface, deeper than cassava, making the plant highly drought resistant. When drought does strike, pigeon peas shed all their leaves and go into a state of dormancy just like cassava, coming back to life when the rains return. The peas are a high source of protein (20 percent) and provide all but two of the thirteen amino acids necessary for protein synthesis in humans. The leaves provide animal fodder superior to most grasses and mature stalks are burnt as cooking fuel. There are at least seven varieties of pigeon peas in the region. They are planted with corn—good for the corn because pigeon peas are nitrogen fixing—and after a year the plant provides a continuous yield for six to eight months and can survive for up to five years., yielding for 6-8 months every year (see Nene et al. 1990).

Sorghum (Sorghum vulgare) and Millet (Pennisetum gluaucum): Both crops yield with minimum rainfall. The roots reach more than eight feet beneath the surface, enabling the plant to withstand over two months of drought. When the crop is entirely lost to drought or has been harvested, the stalks can be cut back and the plant will begin growing again. Millet and sorghum have a special status as a subsistence grain crop because it has a very hard, pest, and mold-resistant kernel that can be stored for over two years (see Nzeza 1988).

Corn (Zea mays) and Cowpeas (Phaseolus vulgaris): Farmers reported planting corn and beans more than any other crops, probably a reflection of the fact that they are high-status cash crops, particularly on the plains. Corn and beans are not highly drought resistant although the cultivars planted have traditionally been short season varieties like

those originally planted by the Taino Indians. Beans and corn are among the few plants that yield all at once and even though about 50 percent of the crop may be consumed by the household, they make up one of the most significant sources of income available to farmers. They are planted on the plains and corn is the most productive domesticated nontropical plant species on earth in terms of calories per square meter (Newsom 1993; Prophete 2000).

Peanuts (Arachis hypogaea): Peanuts are even more drought resistant than sorghum and in they can be planted in sandy soil and in dry areas where only cacti and xerophytic plants are found. (see Nzeza 1980). Other important crops all fit into an agricultural strategy that is clearly selected more for eking out a living in the face of an unpredictable market and natural environment than for participating in the world economy. Lima beans, which are intercropped with corn, are nitrogen fixing and begin to yield two to three months after harvest and continue to yield for as long as there is sufficient rainfall. Pumpkins and squash also yield continually as long as there is rain. One of the most important local crops, the Yam reyal, can be planted during dry spells and will begin to grow with the first rains. Like manioc, it can be stored in the ground indefinitely serving as an important food during droughts and other crises. Sugarcane endures for years, propagates itself without human intervention, can be harvested at any time after it is mature, and will grow back after being cut. Perhaps most importantly with regard to sugarcane, the hard fibrous exterior locks in water while the roots extend some eighteen feet underground, making it a completely drought-resistant source of water and high energy food for both people and animals.

Another aspect of the Haitian peasant subsistence strategy that should be emphasized here is that the crops planted do not require simultaneous harvesting but yield slowly over a period of several months, even year round. The cropping strategy adopted ensures that several staples will be available in the garden in every month of the year. Crop harvesting cycles are complemented by the availability of produce from at least nineteen types of fruit and nut trees, most of which are not planted deliberately but rather selectively permitted to grow and the harvests of which conveniently fall during the some of the leanest months for garden produce. Fruits are sold in the markets for local consumption, they are given away freely among friends and neighbors, and are consumed in abundance by everyone.

For those who may be interested in these type of trends, many of the crops planted in the Southest are survivals from pre-colonial agricultural strategies. Indeed, agricultural the strategy practices in the Southeast is largely inherited from the Taino Indians, making it an in situ survival strategy that has been practiced on the island for at least 1,000 years. The consistency is such that in the neighboring Dominican Republic, where *campesinos* use an almost identical cropping strategy the word for garden is the Taino term *conuco*

Table n7: Commonly planted crops by origin

Crops planted	Origin	*Crops planted*	Origin
Corn	Taino/Americas	*Yam*	Africa, Asia
*Beans**	Taino/Americas	*Okra*	Africa
Sweet Potato	Taino/Americas	*Arrow root*	Taino/Americas
Cassava	Taino/Americas	*Castor Bean*	Africa
Peanuts	Taino/Americas	*Egg Plant*	Asia
Millet	Africa, Asia	*Carrot*	British Isles
Pumpkin	Taino/Americas	*Tomato*	Taino/Americas
Plantain	Philippines	*Echalot*	
Sugar Cane	Asia	*Squash*	Taino/Americas
Watermelon	Africa	*Other*	
Sesame	Africa, Asia		

[xv]

Table n8: Regional tree cycles (H = harvest) for the eighteen most common fruits and nuts

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Avocado	0	0	0	0	0	HH	HHH	HHH	HHH	HHH	HHH	HH
Mango	H	H	H	HH	HHH	HHH	HHH	HH	H	H	H	H
Bread nuts	0	0	H	HH	HHH	HHH	HHH	HH	0	0	0	0
Bread fruit	0	0	H	H	H	H	H	H	0	0	0	0
Kenep (*liche*)	0	0	0	H	H	HHH	HHH	H	H	0	0	0
Oranges (sweet)	HHH	HHH	0	H	H	H	H	H	H	0	0	HHH
Grapefruit	HHH	HHH	0	H	H	H	H	H	H	0	0	HHH
Limes	H	H	H	H	HHH	HHH	HHH	H	H	H	H	H
Oranges (sour)	H	H	H	H	H	H	H	H	H	H	H	H
Coconut	H	H	H	H	H	H	H	H	H	H	H	H
Papaya	H	H	H	H	H	H	H	H	H	H	H	H
Corosol	HHH	HHH	HHH	HHH	HH	0	0	0	0	0	0	0
Grenadia	H	H	H	H	H	H	H	H	H	H	H	H
Abriko	HHH	HHH	HH	H	H	H	H	H	H	H	H	H
Almonds	0	0	0	0	0	H	HHH	HHH	H	0	0	0
Cashews	0	0	0	0	0	H	HHH	HHH	H	0	0	0

Many if not most fruit trees are not planted deliberately but rather selectively permitted to grow and the harvests of which conveniently fall during the leanest months for garden produce. Fruits are sold in the markets for local consumption, hauled by sara to the urban Port-au-Prince market, they are given away freely among friends and neighbors, and are consumed in abundance by everyone, especially children.

[xvi]

Table n.9: Regional planting cycles on the plain Jean Rabel (H = harvest)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Beans		H	H	H								
Cow peas	H	H	H	H	H	H	H					
Lima beans	H	H	H	H	H	H	H					
Pigeon peas	H	H	H	H	H	H	H					
Corn		H	H	H								
Peanuts			H	H						H		
Millet		H	H									
Manioc	H	H	H	H	H	H	H	H	H	H	H	H
Sweet potato	H	H	H	H	H	H	H	H	H	H	H	H
Plantains	H	H	H	H	H	H	H	H	H	H	H	H
Squash	H	H	H	H	H	H					H	H
Sugarcane	H	H	H	H	H	H	H	H	H	H	H	H
Yam	H	H	H	H	H	H	H	H	H	H	H	H

[xvii] At least 8 major earthquakes have hit the island in the past 250 years and probably more; the most destructive were one in 1751, destroying Port-au-Prince; another in 1842, estimated at an equivalent of 8.5 on the richter scale it destroyed both Cape Haitian and the Dominican city of Santiago some 150 miles away; and one in1935 that created a tsunami, swamped sections of the North coast and killed thousands. In my own research in church archives in the northern town of Port-de-Paix, I noted that a severe earthquake hits on average every 43 years. They are currently overdue by some 40 years.

[xviii] Beginning with the 13 years of warfare that ended slavery was a conflagration during which more people died per capita than during any war in human history and once again, beginning in 1820 independent Haiti found itself

falling under its first trade embargo, consequence of an agreement between England and France and the French demand for compensation for property lost by virtue of the revolution, including the cost of slaves; and from 1843 until 1889 the country, particularly the South where reigned the *piquet* (rural military insurgents), was rocked by no fewer than 18 uprisings and civil wars; for the entire 1890s and into the 1900s the whole country was wracked with warfare; the US invaded in 1914 and another five years of intensive guerrilla warfare ensued (Saint-Louis, 1988; Heinl and Heinl, 1979). In recent times political crisis have intermittently cut off trade with the global economy. Cases in point are the many uprisings between 1986 and 1990 and the 1991 coup when the country was virtually shut down under martial law, Port-au-Prince completely blocked off for over a week while the military gunned down some 3,000 impoverished slum dwellers, and then the economy shuttered up for three full years under an international trade embargo maintained by US warships; from 2001 to 2004 Haiti was ... aid embargo.

[xix] Illustrating the point: in the 28 years spanning 1980-2008, 65 hurricanes, tropical storms, and thunderstorms killed 8,165 people in Haiti. In comparison, in the 28 years between 1935 and 1963 – before most aid agencies arrived and when Haiti had a population one third its current size – three storms killed 11,000 people. Specifically in 1935 more than 2000 were killed in an unnamed storm, in 1954 Hurricane Hazel killed over 1,000 people and left the entire country devastated on a scale arguably exceeding the earthquake, and in 1963 Hurricane Flora killed over 8000 Haitians and left similar waste in its path.

[xx] Animals are led to open pasture or checked before dawn. The animals are moved again at least once and sometimes twice during the day to areas with shade and fresh fodder. These times also serve to assure that the animals are not strangling on their cords, that dogs are not in the process of killing them, or that thieves are not in process of stealing them. Small animals such as goats and sheep do not need to be watered when there is abundant rainfall. But when there is not sufficient rainfall, as is common in Southeast, the animals must be watered at least every three days and generally every day during the hot summer months. Rain or shine, large livestock such as cows and pack animals must be watered daily.

The amount of time invested in livestock obviously depends on the number of animals a household owns and the distance from the household to water sources and foraging areas. Except after harvest times, animals are tethered or in the vicinity of the garden or on arid State lands rented from the government. In some areas, such as Bainet, animals are corralled in the arid areas.

It is difficult and probably impractical to try to estimate the amount of time necessary to tend animals. To begin with, there is wide spectrum of intensity with which members of a household can care for their animals. Animals can be turned loose in the kadas and not checked for days, or tethered somewhere and moved only once a day. But these are risky practices that increase the chances of animals being lost, stolen, or killed by dogs. At the other extreme, a household head can see to it that animals are checked and moved at least twice during the day and brought into the yard at night, practices that increase the probability the animals will survive to reproduce and to be sold in the market. But that also requires significantly greater investments in time and labor.

Another factor that complicates the estimation of livestock labor inputs is the difficulty of determining how many animals can be moved or led to the water at the same time. A lone man or woman, for instance, can handle as many as six goats and an unlimited number of sheep. Only one sheep needs to be guided and the rest will follow. Goats will also follow but they are less cooperative. In summary, regarding the time and labor inputs required by a household for livestock raising, the general rule is that the more time and the more labor that is invested, the better.

[xxi] People all over rural Haiti generally do not themselves use charcoal for cooking fuel; they use wood. In almost any region one finds an ongoing production of charcoal with a handful of specialists and intermediaries engaged in the industry and they are considered among the poorest, lowliest people in an area; although the money earned at charcoal production can compare favorably to other occupations, these are people who tend to have less land, animals and no other employable skills. But for most individuals charcoal production is something that occurs when a special need arises, as when someone wants to build a house or finance a new garden and, as discussed in the main body of the report, charcoal production is most conspicuously bound with times of drought and crop failure.

[xxii] Note that high numbers of households members is arguably not the burden during crisis that many observers and aid workers tend to emphasize. When crisis strikes, particularly drought—arguably the most severe type of crisis – demands on household labor increase precipitously. And the principal feature that determines the success of a household in coping with and surviving drought is not how few mouths it has to feed, but how many able bodies it

can put to work. Crop failure turns many households to charcoal production and, as a consequence, local wood supplies dwindle and household members must travel farther and farther to find wood for fuel.

Most problematic is the water supply. Water sources dry up and people have to travel farther to fill their buckets and water animals. Moreover, all households in the region are experiencing the same stress and this means that the fewer water sources are being visited by more people. Springs are packed with crowds of pushing, shoving, and cursing women and children. People get up at midnight so they can arrive at a distant spring before it becomes too crowded and they spend hours waiting to fill a single water jug. Some people, particularly young children, return to the house teary-eyed, trodden and bruised, having failed to procure any water at all. Washing clothes during drought conditions becomes problematic as well. Women must travel great distances to find clean water and a vacant place to sit and scrub. Animals have to be watered more frequently since the desiccated fodder dehydrates them. Fodder itself becomes scarce, so farmers are traveling farther and farther into remote areas to graze their animals or to cut grass for them and then they must lead the animals more frequently in the other direction, into more peopled areas, where there are adequate water sources that have not dried up.

All of this additional effort translates into more labor and the need for more workers because, rain or no rain, people must eat and they must drink. Food still must be cooked, water found, clothes washed, and at least some animals must be kept alive so that when the drought finally does end there will be something with which to start producing again. The same logic of increased labor demand associated with crises can be applied to the most marginal regions. The poorest people usually live in the most marginal areas, which by definition those areas farthest from water and markets, thus increasing household labor requirements.

[xxiii] Many of the items used in and around households are procured or manufactured by household members from useful plants, trees, and shrubs found in the yard, growing up around the garden, along paths, or in the arid State land. Limes and sour oranges are used as an all-purpose disinfectant and aloe as a hair oil and shampoo.. Baskets are made of grasses and splintered bamboo. Sleeping mats are made from dried plantain stalks. Gourds from the kalbas tree provide a range of different sized storage and drinking vessels. Sticks are collected for use as cooking fuel. To start fires locals use the abundant and flammable coconut husks, dried orange peelings, and a pitch pine (from the native Hispaniola pine found abundantly in the nearby National park, the Pine Forest).
-People of the Southeast to have historically suffered recurrent nutritional crisis less frequently than other regions, such as the Northwest, the Plateau Central, and even nearby Plain of Leogane. This observation is supportded by informants identifying far fewer edible wild plants. They did report knowledge of several wild leaves and a wild yam but they were not able to expound on the subject nor did they report a need to resort to these items. For example, people in nearby Leogane commonly eat boiled gree mangos as a nutritional coping strategy during times of scarcity, but people in the region we studied laugh at the prospect. When probed on the issue of some informants did note opportunistically eating feral cats, iguanas, and most types of birds—including eagles, hawks, woodpeckers, and even buzzards. They also consume land crabs, fresh-water crabs, crayfish, and even snake. They do not eat horse as people in North Haiti have begun to do in the past 15 years.

[xxiv] Motorcycles have become affordable to the general population only in the past 15 years. Their availability began in the mid 1990s with massive imports of second hand, refurbished Honda Cubs (scooters) from Japan. In the early 2000s Chinese Motorcycles became available at even lower prices giving way to virtual revolution in transportation on par in impact with that of the cell phone, something that became widely available at the same time. The use of motorcycles has been especially advantageous to young men who are overwhelmingly the drivers. But also to older individuals. They provide an investment opportunity. People with the resources buy them and then rent or lease them to younger family members or trusted friends (the going rate is 250 goud per day). In this way the economic impact of the new industry effects a wide number of people. Also notable is that several informants spontaneously remarked that if it was not for taxis, the current crisis would have been more severe because young men, not having any other recourse to income, would have been more prone to steal garden produce and livestock.

[xxv] Although at times devastating, the impact of hurricanes are generally not as severe as those associated with drought tuber crops such as manioc, sweet potatoes, arrowroot, and yams survive and even benefit from the abundant rainfall. Prolonged droughts are more devastating. Only the hardiest crops and livestock survive. Animals that may have survived hurricanes and the associated disease that often comes with them are more likely to die. People who are old or sick are more likely to die at these times. Stricken families begin moving, going from house to house begging for morsels of food. Livestock theft and banditry increases. Commercial activity becomes

perilous because desperate people sometimes hide themselves in the brush by trails and charge unsuspecting voyagers, hurling rocks and screaming, driving the traveler away from her donkey and seizing her merchandise.

[xxvi] Testimony to the effectiveness of this strategy is that it was Hurricane Hazel in 1954, known locally as *douz oktob* (the Twelfth of October) is remembered as the most economically severe calamities of the 20th century. The reason is because it devastated the entire country, effectively destroying the capacity for regional interdependency to ameliorate crisis.

[xxvii] While the NGOs may have meant no harm, the policy makers deliberately intended to crash the Haitian domestic agricultural market and debilitate Haitian agricultural productivity. The motivation was pursuit of markets for their own farmers in conjunction with interests of offshore venture capitalists who hoped the consequent migration of peasants to urban areas would increase supply of low wage labor for factories (See DeWind and Kinley 1988; Oxfam 2005). Beginning about 2005 – by which point in time the Haitian agricultural production had been all but destroyed – new policy makers began to apologize for their predecessors (WFP 2006; US Gov 2009).

[xxviii] In a 2006 white paper presaging the overhaul of overseas food relief and development police the US State Department noted that,

> In the past, our efforts have been undermined by a lack of coordination, limited transparency, uneven monitoring and evaluation, and relationships with recipient countries based more on patronage than partnership.
> (P 3: SEEKING A WORLD WITHOUT HUNGER, http://www.state.gov/s/globalfoodsecurity)

[xxix] Perhaps the most interesting and counterintuitive point for most aid workers is that while rural people in Haiti are the poorest, most marginalized and chronically malnourished people in the country, their livelihood strategies are arguably those most adapted to crisis: they depend on the internal marketing system, retain the knowledge of retreating into autonomous survival strategies that can be accomplished with locally available materials, and hence are the most resilient and capable of recuperating from disaster and calamity. During the 1991 -1994 international embargo Grand Anse childhood malnutrition increased, but only by from 17% to 19% of children. Whether conclusive evidence of the resiliency it is nevertheless noteworthy that this was at a moment in time when 400,000 people living in urban areas returned to Haitian farms and also depended on the strategies discussed above; at the national level in 1994, at the end of the embargo, severe malnutrition was 3.9%. This is less than 4.1%, the rate two years later, in 1996, when those 400,000 people had gone back to urban areas (USAID 1999).

As seen, development can interfere with household livelihood strategies. Moreover, in times of crisis it is precisely those endeavors based on industrial technologies and access to overseas markets that suffer most and that are most costly to recuperate. Indeed, this difference in the stability and independence of these two very different production and market chains – what we can call artisanal-market vs. industrial-export – is precisely why the former continues to prevail in Haiti. Two centuries of natural disaster, and ecological and political crisis has conditioned most of the population to be highly conservative and remain dependent on the artisanal strategy that, if petty in terms of income, is highly stable and risk aversive.

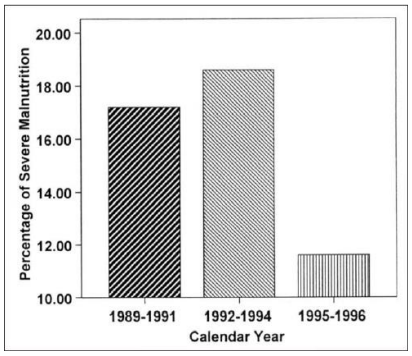


Figure 1: Percentage of Severely Malnourished Grand Anse Children in HHF Samples (Reid et. al. 2007)

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